

SEQUENCE LISTING

<110> Telford, John L.
Grandi, Guido
Margarit Y Ros, Immaculada
Maione, Domenico

<120> Immunogenic Compositions for Streptococcus agalactiae

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002441.00189

<140> 10/568,422

<141> 2006-02-14

<150> PCT/US04/030032

<151> 2004-09-15

<150> US 60/548,789

<151> 2004-02-28

<150> PCT/US03/29167

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<213> Streptococcus agalactiae

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Ala	Glu	Val	Ser	Gln	Glu	Arg	Pro	Ala	Lys	Thr	Thr	Val	Asn	Ile	Tyr	
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Lys	Leu	Gln	Ala	Asp	Ser	Tyr	Lys	Ser	Glu	Ile	Thr	Ser	Asn	Gly	Gly	
			20					25					30			
Ile	Glu	Asn	Lys	Asp	Gly	Glu	Val	Ile	Ser	Asn	Tyr	Ala	Lys	Leu	Gly	
		35				40						45				
Asp	Asn	Val	Lys	Gly	Leu	Gln	Gly	Val	Gln	Phe	Lys	Arg	Tyr	Lys	Val	
	50					55					60					

Lys	Thr	Asp	Ile	Ser	Val	Asp	Glu	Leu	Lys	Lys	Leu	Thr	Thr	Val	Glu	65	70	75	80
Ala	Ala	Asp	Ala	Lys	Val	Gly	Thr	Ile	Leu	Glu	Glu	Gly	Val	Ser	Leu	85	90	95	
Pro	Gln	Lys	Thr	Asn	Ala	Gln	Gly	Leu	Val	Val	Asp	Ala	Leu	Asp	Ser	100	105	110	
Lys	Ser	Asn	Val	Arg	Tyr	Leu	Tyr	Val	Glu	Asp	Leu	Lys	Asn	Ser	Pro	115	120	125	
Ser	Asn	Ile	Thr	Lys	Ala	Tyr	Ala	Val	Pro	Phe	Val	Leu	Glu	Leu	Pro	130	135	140	
Val	Ala	Asn	Ser	Thr	Gly	Thr	Gly	Phe	Leu	Ser	Glu	Ile	Asn	Ile	Tyr	145	150	155	160
Pro	Lys	Asn	Val	Val	Thr	Asp	Glu	Pro	Lys	Thr	Asp	Lys	Asp	Val	Lys	165	170	175	
Lys	Leu	Gly	Gln	Asp	Asp	Ala	Gly	Tyr	Thr	Ile	Gly	Glu	Glu	Phe	Lys	180	185	190	
Trp	Phe	Leu	Lys	Ser	Thr	Ile	Pro	Ala	Asn	Leu	Gly	Asp	Tyr	Glu	Lys	195	200	205	
Phe	Glu	Ile	Thr	Asp	Lys	Phe	Ala	Asp	Gly	Leu	Thr	Tyr	Lys	Ser	Val	210	215	220	
Gly	Lys	Ile	Lys	Ile	Gly	Ser	Lys	Thr	Leu	Asn	Arg	Asp	Glu	His	Tyr	225	230	235	240
Thr	Ile	Asp	Glu	Pro	Thr	Val	Asp	Asn	Gln	Asn	Thr	Leu	Lys	Ile	Thr	245	250	255	
Phe	Lys	Pro	Glu	Lys	Phe	Lys	Glu	Ile	Ala	Glu	Leu	Leu	Lys	Gly	Met	260	265	270	
Thr	Leu	Val	Lys	Asn	Gln	Asp	Ala	Leu	Asp	Lys	Ala	Thr	Ala	Asn	Thr	275	280	285	
Asp	Asp	Ala	Ala	Phe	Leu	Glu	Ile	Pro	Val	Ala	Ser	Thr	Ile	Asn	Glu	290	295	300	
Lys	Ala	Val	Leu	Gly	Lys	Ala	Ile	Glu	Asn	Thr	Phe	Glu	Leu	Gln	Tyr	305	310	315	320
Asp	His	Thr	Pro	Asp	Lys	Ala	Asp	Asn	Pro	Lys	Pro	Ser	Asn	Pro	Pro	325	330	335	
Arg	Lys	Pro	Glu	Val	His	Thr	Gly	Gly	Lys	Arg	Phe	Val	Lys	Lys	Asp	340	345	350	
Ser	Thr	Glu	Thr	Gln	Thr	Leu	Gly	Gly	Ala	Glu	Phe	Asp	Leu	Leu	Ala	355	360	365	
Ser	Asp	Gly	Thr	Ala	Val	Lys	Trp	Thr	Asp	Ala	Leu	Ile	Lys	Ala	Asn				
	370					375					380								
Thr	Asn	Lys	Asn	Tyr	Ile	Ala	Gly	Glu	Ala	Val	Thr	Gly	Gln	Pro	Ile	385	390	395	400
Lys	Leu	Lys	Ser	His	Thr	Asp	Gly	Thr	Phe	Glu	Ile	Lys	Gly	Leu	Ala	405	410	415	
Tyr	Ala	Val	Asp	Ala	Asn	Ala	Glu	Gly	Thr	Ala	Val	Thr	Tyr	Lys	Leu	420	425	430	
Lys	Glu	Thr	Lys	Ala	Pro	Glu	Gly	Tyr	Val	Ile	Pro	Asp	Lys	Glu	Ile	435	440	445	
Glu	Phe	Thr	Val	Ser	Gln	Thr	Ser	Tyr	Asn	Thr	Lys	Pro	Thr	Asp	Ile	450	455	460	
Thr	Val	Asp	Ser	Ala	Asp	Ala	Thr	Pro	Asp	Thr	Ile	Lys	Asn	Asn	Lys	465	470	475	480
Arg	Pro	Ser																	

<210> 8
 <211> 271
 <212> PRT
 <213> Streptococcus agalactiae

<400> 8
 Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr Thr Val Asn Ile Tyr
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 Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile Thr Ser Asn Gly Gly
 20 25 30
 Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn Tyr Ala Lys Leu Gly
 35 40 45
 Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe Lys Arg Tyr Lys Val
 50 55 60
 Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys Leu Thr Thr Val Glu
 65 70 75 80
 Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu Glu Gly Val Ser Leu
 85 90 95
 Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val Asp Ala Leu Asp Ser
 100 105 110
 Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp Leu Lys Asn Ser Pro
 115 120 125
 Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe Val Leu Glu Leu Pro
 130 135 140
 Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser Glu Ile Asn Ile Tyr
 145 150 155 160
 Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr Asp Lys Asp Val Lys
 165 170 175
 Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile Gly Glu Glu Phe Lys
 180 185 190
 Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu Gly Asp Tyr Glu Lys
 195 200 205
 Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu Thr Tyr Lys Ser Val
 210 215 220
 Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn Arg Asp Glu His Tyr
 225 230 235 240
 Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn Thr Leu Lys Ile Thr
 245 250 255
 Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu Leu Leu Lys Gly
 260 265 270

<210> 9
 <211> 212
 <212> PRT
 <213> Streptococcus agalactiae

<400> 9
 Met Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys Ala Thr Ala Asn
 1 5 10 15
 Thr Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala Ser Thr Ile Asn
 20 25 30
 Glu Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr Phe Glu Leu Gln
 35 40 45
 Tyr Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys Pro Ser Asn Pro

50	55	60
Pro Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg Phe Val Lys Lys		
65	70	75
Asp Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu Phe Asp Leu Leu		80
	85	90
Ala Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala Leu Ile Lys Ala		95
	100	105
Asn Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val Thr Gly Gln Pro		110
	115	120
Ile Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu Ile Lys Gly Leu		125
	130	135
Ala Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala Val Thr Tyr Lys		140
145	150	155
Leu Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile Pro Asp Lys Glu		160
	165	170
Ile Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr Lys Pro Thr Asp		175
	180	185
Ile Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr Ile Lys Asn Asn		190
	195	200
Lys Arg Pro Ser		205
210		

<210> 10

<211> 1629

<212> DNA

<213> Streptococcus agalactiae

<400> 10

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ggtttagcat cagtaatttt agggtcattc ataatgggtca caagtcctgt ttttgcggat	120
caaaactacat cggttcaagt taataatcag acaggcacta gtgtggatgc taataattct	180
tccaatgaga caagtgcgtc aagtgtgatt acttccaata atgatagtgt tcaagcgtct	240
gataaagttg taaatagtca aaatacggca acaaaggaca ttactactcc tttagtagag	300
acaaagccaa tgggtgaaaa aacattacct gaacaaggga attatgttta tagcaaagaa	360
accgaggtga aaaatacacc ttcaaaatca gccccagtag ctttctatgc aaagaaaggt	420
gataaagttt tctatgacca agtattttaat aaagataatg tgaaatggat ttcataataag	480
tctttttgtg gcgtacgtcg atacgcagct attgagtcac tagatccatc aggaggttca	540
gagactaaag cacctactcc tgtaacaaat tcaggaagca ataatacaaga gaaaatagca	600
acgcaaggaa attatacatt ttcacataaa gtagaagtaa aaaatgaagc taaggtagcg	660
agtccaactc aattttacatt ggacaaaagga gacagaattt tttacgacca aatactaact	720
attgaaggaa atcagtgggt atcttataaa tcattcaatg gtgttcgtcg ttttggtttg	780
ctaggtaaag catcttcagt agaaaaaact gaagataaag aaaaagtgtc tcctcaacca	840
caagcccgtg ttactaaaac tggtagactg actattttcta acgaaacaac tacaggtttt	900
gatattttta ttacgaatat taaagatgat aacgggtatcg ctgctgttaa ggtaccgggt	960
tggactgaac aaggagggca agatgatatt aaatgggtata cagctgtaac tactggggat	1020
ggcaactaca aagtagctgt atcatttgct gaccataaga atgagaaggg tctttataat	1080
attcatttat actaccaaga agctagtggg acacttgtag gtgtaacagg aactaaagtg	1140
acagtagctg gaactaatc ttctcaagaa cctattgaaa atgggtttagc aaagactgggt	1200
gtttataata ttatcggaag tactgaagta aaaaatgaag ctaaaatatc aagtcagacc	1260
caattttact tagaaaaagg tgacaaaata aattatgatc aagtattgac agcagatgggt	1320
taccagtgga tttcttacaa atcttatagt ggtgttcgtc gctatattcc tgtgaaaaag	1380
ctaactacaa gtagtgaaaa agcgaaagat gaggcgacta aaccgactag ttatcccaac	1440
ttacctaata caggtaccta tacattttact aaaactgtag atgtgaaaag tcaacctaaa	1500
gtatcaagtc cagtgggaatt taattttcaa aagggtgaaa aaatacatta tgatcaagtg	1560
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attgaaatt

1629

<210> 11

<211> 543

<212> PRT

<213> Streptococcus agalactiae

<400> 11

Met	Lys	Lys	Gly	Gln	Val	Asn	Asp	Thr	Lys	Gln	Ser	Tyr	Ser	Leu	Arg
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Lys	Tyr	Lys	Phe	Gly	Leu	Ala	Ser	Val	Ile	Leu	Gly	Ser	Phe	Ile	Met
			20					25					30		
Val	Thr	Ser	Pro	Val	Phe	Ala	Asp	Gln	Thr	Thr	Ser	Val	Gln	Val	Asn
		35					40					45			
Asn	Gln	Thr	Gly	Thr	Ser	Val	Asp	Ala	Asn	Asn	Ser	Ser	Asn	Glu	Thr
	50					55					60				
Ser	Ala	Ser	Ser	Val	Ile	Thr	Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser
65					70					75					80
Asp	Lys	Val	Val	Asn	Ser	Gln	Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr
				85					90					95	
Pro	Leu	Val	Glu	Thr	Lys	Pro	Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln
			100					105					110		
Gly	Asn	Tyr	Val	Tyr	Ser	Lys	Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser
		115					120					125			
Lys	Ser	Ala	Pro	Val	Ala	Phe	Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe
	130					135					140				
Tyr	Asp	Gln	Val	Phe	Asn	Lys	Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys
145					150					155					160
Ser	Phe	Cys	Gly	Val	Arg	Arg	Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro
				165					170					175	
Ser	Gly	Gly	Ser	Glu	Thr	Lys	Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly
			180					185					190		
Ser	Asn	Asn	Gln	Glu	Lys	Ile	Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser
		195					200					205			
His	Lys	Val	Glu	Val	Lys	Asn	Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln
	210					215					220				
Phe	Thr	Leu	Asp	Lys	Gly	Asp	Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr
225					230					235					240
Ile	Glu	Gly	Asn	Gln	Trp	Leu	Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg
				245					250					255	
Arg	Phe	Val	Leu	Leu	Gly	Lys	Ala	Ser	Ser	Val	Glu	Lys	Thr	Glu	Asp
			260					265					270		
Lys	Glu	Lys	Val	Ser	Pro	Gln	Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly
		275					280					285			
Arg	Leu	Thr	Ile	Ser	Asn	Glu	Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile
	290					295					300				
Thr	Asn	Ile	Lys	Asp	Asp	Asn	Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val
305					310					315					320
Trp	Thr	Glu	Gln	Gly	Gly	Gln	Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val
				325					330					335	
Thr	Thr	Gly	Asp	Gly	Asn	Tyr	Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His
			340					345					350		
Lys	Asn	Glu	Lys	Gly	Leu	Tyr	Asn	Ile	His	Leu	Tyr	Tyr	Gln	Glu	Ala
		355					360					365			
Ser	Gly	Thr	Leu	Val	Gly	Val	Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly

370	375	380
Thr Asn Ser Ser Gln Glu Pro Ile Glu Asn Gly Leu Ala Lys Thr Gly		
385	390	395
Val Tyr Asn Ile Ile Gly Ser Thr Glu Val Lys Asn Glu Ala Lys Ile		400
	405	410
Ser Ser Gln Thr Gln Phe Thr Leu Glu Lys Gly Asp Lys Ile Asn Tyr		415
	420	425
Asp Gln Val Leu Thr Ala Asp Gly Tyr Gln Trp Ile Ser Tyr Lys Ser		430
	435	440
Tyr Ser Gly Val Arg Arg Tyr Ile Pro Val Lys Lys Leu Thr Thr Ser		445
	450	455
Ser Glu Lys Ala Lys Asp Glu Ala Thr Lys Pro Thr Ser Tyr Pro Asn		460
465	470	475
Leu Pro Lys Thr Gly Thr Tyr Thr Phe Thr Lys Thr Val Asp Val Lys		480
	485	490
Ser Gln Pro Lys Val Ser Ser Pro Val Glu Phe Asn Phe Gln Lys Gly		495
	500	505
Glu Lys Ile His Tyr Asp Gln Val Leu Val Val Asp Gly His Gln Trp		510
	515	520
Ile Ser Tyr Lys Ser Tyr Ser Gly Ile Arg Arg Tyr Ile Glu Ile		525
	530	535
		540

<210> 12

<211> 504

<212> PRT

<213> Streptococcus agalactiae

<400> 12

Asp Gln Thr Thr Ser Val Gln Val Asn Asn Gln Thr Gly Thr Ser Val	
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Asp Ala Asn Asn Ser Ser Asn Glu Thr Ser Ala Ser Ser Val Ile Thr	10
	20
Ser Asn Asn Asp Ser Val Gln Ala Ser Asp Lys Val Val Asn Ser Gln	25
	30
	35
Asn Thr Ala Thr Lys Asp Ile Thr Thr Pro Leu Val Glu Thr Lys Pro	40
50	45
Met Val Glu Lys Thr Leu Pro Glu Gln Gly Asn Tyr Val Tyr Ser Lys	55
65	60
Glu Thr Glu Val Lys Asn Thr Pro Ser Lys Ser Ala Pro Val Ala Phe	65
	70
	75
Tyr Ala Lys Lys Gly Asp Lys Val Phe Tyr Asp Gln Val Phe Asn Lys	80
	85
	90
Asp Asn Val Lys Trp Ile Ser Tyr Lys Ser Phe Cys Gly Val Arg Arg	95
	100
	105
Tyr Ala Ala Ile Glu Ser Leu Asp Pro Ser Gly Gly Ser Glu Thr Lys	110
	115
	120
Ala Pro Thr Pro Val Thr Asn Ser Gly Ser Asn Asn Gln Glu Lys Ile	125
130	135
	140
Ala Thr Gln Gly Asn Tyr Thr Phe Ser His Lys Val Glu Val Lys Asn	145
	150
	155
Glu Ala Lys Val Ala Ser Pro Thr Gln Phe Thr Leu Asp Lys Gly Asp	160
	165
	170
Arg Ile Phe Tyr Asp Gln Ile Leu Thr Ile Glu Gly Asn Gln Trp Leu	175
	180
	185
Ser Tyr Lys Ser Phe Asn Gly Val Arg Arg Phe Val Leu Leu Gly Lys	190
	195
	200
	205

210		215		220
Ala Ser Ser Val Glu Lys Thr Glu Asp Lys Glu Lys Val Ser Pro Gln				
225		230		240
Pro Gln Ala Arg Ile Thr Lys Thr Gly Arg Leu Thr Ile Ser Asn Glu				
	245		250	255
Thr Thr Thr Gly Phe Asp Ile Leu Ile Thr Asn Ile Lys Asp Asp Asn				
	260		265	270
Gly Ile Ala Ala Val Lys Val Pro Val Trp Thr Glu Gln Gly Gly Gln				
	275		280	285
Asp Asp Ile Lys Trp Tyr Thr Ala Val Thr Thr Gly Asp Gly Asn Tyr				
	290		295	300
Lys Val Ala Val Ser Phe Ala Asp His Lys Asn Glu Lys Gly Leu Tyr				
305		310		320
Asn Ile His Leu Tyr Tyr Gln Glu Ala Ser Gly Thr Leu Val Gly Val				
	325		330	335
Thr Gly Thr Lys Val Thr Val Ala Gly Thr Asn Ser Ser Gln Glu Pro				
	340		345	350
Ile Glu Asn Gly Leu Ala Lys Thr Gly Val Tyr Asn Ile Ile Gly Ser				
	355		360	365
Thr Glu Val Lys Asn Glu Ala Lys Ile Ser Ser Gln Thr Gln Phe Thr				
	370		375	380
Leu Glu Lys Gly Asp Lys Ile Asn Tyr Asp Gln Val Leu Thr Ala Asp				
385		390		400
Gly Tyr Gln Trp Ile Ser Tyr Lys Ser Tyr Ser Gly Val Arg Arg Tyr				
	405		410	415
Ile Pro Val Lys Lys Leu Thr Thr Ser Ser Glu Lys Ala Lys Asp Glu				
	420		425	430
Ala Thr Lys Pro Thr Ser Tyr Pro Asn Leu Pro Lys Thr Gly Thr Tyr				
	435		440	445
Thr Phe Thr Lys Thr Val Asp Val Lys Ser Gln Pro Lys Val Ser Ser				
	450		455	460
Pro Val Glu Phe Asn Phe Gln Lys Gly Glu Lys Ile His Tyr Asp Gln				
465		470		475
Val Leu Val Val Asp Gly His Gln Trp Ile Ser Tyr Lys Ser Tyr Ser				
	485		490	495
Gly Ile Arg Arg Tyr Ile Glu Ile				
	500			

<210> 13
 <211> 485
 <212> PRT
 <213> Streptococcus agalactiae

<400> 13
Met Lys Lys Gly Gln Val Asn Asp Thr Lys Gln Ser Tyr Ser Leu Arg
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Lys Tyr Lys Phe Gly Leu Ala Ser Val Ile Leu Gly Ser Phe Ile Met
20 25 30
Val Thr Ser Pro Val Phe Ala Asp Gln Thr Thr Ser Val Gln Val Asn
35 40 45
Asn Gln Thr Gly Thr Ser Val Asp Ala Asn Asn Ser Ser Asn Glu Thr
50 55 60
Ser Ala Ser Ser Val Ile Thr Ser Asn Asn Asp Ser Val Gln Ala Ser
65 70 75 80
Asp Lys Val Val Asn Ser Gln Asn Thr Ala Thr Lys Asp Ile Thr Thr

				85				90					95				
Pro	Leu	Val	Glu	Thr	Lys	Pro	Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln		
			100					105					110				
Gly	Asn	Tyr	Val	Tyr	Ser	Lys	Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser		
		115					120					125					
Lys	Ser	Ala	Pro	Val	Ala	Phe	Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe		
		130				135					140						
Tyr	Asp	Gln	Val	Phe	Asn	Lys	Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys		
145					150					155					160		
Ser	Phe	Cys	Gly	Val	Arg	Arg	Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro		
			165						170					175			
Ser	Gly	Gly	Ser	Glu	Thr	Lys	Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly		
			180					185					190				
Ser	Asn	Asn	Gln	Glu	Lys	Ile	Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser		
		195					200					205					
His	Lys	Val	Glu	Val	Lys	Asn	Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln		
		210				215					220						
Phe	Thr	Leu	Asp	Lys	Gly	Asp	Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr		
225					230					235					240		
Ile	Glu	Gly	Asn	Gln	Trp	Leu	Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg		
			245						250					255			
Arg	Phe	Val	Leu	Leu	Gly	Lys	Ala	Ser	Ser	Val	Glu	Lys	Thr	Glu	Asp		
			260					265					270				
Lys	Glu	Lys	Val	Ser	Pro	Gln	Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly		
		275				280						285					
Arg	Leu	Thr	Ile	Ser	Asn	Glu	Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile		
		290			295						300						
Thr	Asn	Ile	Lys	Asp	Asp	Asn	Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val		
305					310					315					320		
Trp	Thr	Glu	Gln	Gly	Gly	Gln	Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val		
			325						330					335			
Thr	Thr	Gly	Asp	Gly	Asn	Tyr	Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His		
			340					345					350				
Lys	Asn	Glu	Lys	Gly	Leu	Tyr	Asn	Ile	His	Leu	Tyr	Tyr	Gln	Glu	Ala		
		355					360					365					
Ser	Gly	Thr	Leu	Val	Gly	Val	Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly		
		370				375					380						
Thr	Asn	Ser	Ser	Gln	Glu	Pro	Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly		
385					390					395					400		
Val	Tyr	Asn	Ile	Ile	Gly	Ser	Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile		
			405						410					415			
Ser	Ser	Gln	Thr	Gln	Phe	Thr	Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr		
			420					425					430				
Asp	Gln	Val	Leu	Thr	Ala	Asp	Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser		
		435				440						445					
Tyr	Ser	Gly	Val	Arg	Arg	Tyr	Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser		
		450				455					460						
Ser	Glu	Lys	Ala	Lys	Asp	Glu	Ala	Thr	Lys	Pro	Thr	Ser	Tyr	Pro	Asn		
465					470					475					480		
Leu	Pro	Lys	Thr	Gly													
				485													

<210> 14
 <211> 5
 <212> PRT

<213> Streptococcus agalactiae

<400> 14

Leu Thr Lys Thr Gly
1 5

<210> 15

<211> 480

<212> PRT

<213> Streptococcus agalactiae

<400> 15

Met	Lys	Lys	Gly	Gln	Val	Asn	Asp	Thr	Lys	Gln	Ser	Tyr	Ser	Leu	Arg
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Lys	Tyr	Lys	Phe	Gly	Leu	Ala	Ser	Val	Ile	Leu	Gly	Ser	Phe	Ile	Met
			20					25					30		
Val	Thr	Ser	Pro	Val	Phe	Ala	Asp	Gln	Thr	Thr	Ser	Val	Gln	Val	Asn
		35					40					45			
Asn	Gln	Thr	Gly	Thr	Ser	Val	Asp	Ala	Asn	Asn	Ser	Ser	Asn	Glu	Thr
	50					55					60				
Ser	Ala	Ser	Ser	Val	Ile	Thr	Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser
65					70					75					80
Asp	Lys	Val	Val	Asn	Ser	Gln	Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr
				85					90					95	
Pro	Leu	Val	Glu	Thr	Lys	Pro	Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln
			100					105					110		
Gly	Asn	Tyr	Val	Tyr	Ser	Lys	Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser
		115					120					125			
Lys	Ser	Ala	Pro	Val	Ala	Phe	Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe
	130					135					140				
Tyr	Asp	Gln	Val	Phe	Asn	Lys	Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys
145					150					155					160
Ser	Phe	Cys	Gly	Val	Arg	Arg	Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro
				165					170					175	
Ser	Gly	Gly	Ser	Glu	Thr	Lys	Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly
			180					185					190		
Ser	Asn	Asn	Gln	Glu	Lys	Ile	Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser
		195					200					205			
His	Lys	Val	Glu	Val	Lys	Asn	Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln
	210					215					220				
Phe	Thr	Leu	Asp	Lys	Gly	Asp	Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr
225					230					235					240
Ile	Glu	Gly	Asn	Gln	Trp	Leu	Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg
				245					250					255	
Arg	Phe	Val	Leu	Leu	Gly	Lys	Ala	Ser	Ser	Val	Glu	Lys	Thr	Glu	Asp
			260					265					270		
Lys	Glu	Lys	Val	Ser	Pro	Gln	Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly
		275					280					285			
Arg	Leu	Thr	Ile	Ser	Asn	Glu	Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile
	290					295					300				
Thr	Asn	Ile	Lys	Asp	Asp	Asn	Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val
305					310					315					320
Trp	Thr	Glu	Gln	Gly	Gly	Gln	Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val
				325					330					335	
Thr	Thr	Gly	Asp	Gly	Asn	Tyr	Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His

				340					345					350			
Lys	Asn	Glu	Lys	Gly	Leu	Tyr	Asn	Ile	His	Leu	Tyr	Tyr	Gln	Glu	Ala		
		355					360					365					
Ser	Gly	Thr	Leu	Val	Gly	Val	Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly		
	370					375					380						
Thr	Asn	Ser	Ser	Gln	Glu	Pro	Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly		
385					390					395					400		
Val	Tyr	Asn	Ile	Ile	Gly	Ser	Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile		
			405						410						415		
Ser	Ser	Gln	Thr	Gln	Phe	Thr	Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr		
		420						425					430				
Asp	Gln	Val	Leu	Thr	Ala	Asp	Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser		
	435						440					445					
Tyr	Ser	Gly	Val	Arg	Arg	Tyr	Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser		
	450					455					460						
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<210> 16
 <211> 446
 <212> PRT
 <213> Streptococcus agalactiae

<400> 16

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		20						25					30				
Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser	Asp	Lys	Val	Val	Asn	Ser	Gln		
	35					40						45					
Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr	Pro	Leu	Val	Glu	Thr	Lys	Pro		
	50					55					60						
Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln	Gly	Asn	Tyr	Val	Tyr	Ser	Lys		
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Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser	Lys	Ser	Ala	Pro	Val	Ala	Phe		
				85				90						95			
Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe	Tyr	Asp	Gln	Val	Phe	Asn	Lys		
			100					105					110				
Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys	Ser	Phe	Cys	Gly	Val	Arg	Arg		
	115						120					125					
Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro	Ser	Gly	Gly	Ser	Glu	Thr	Lys		
	130					135					140						
Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly	Ser	Asn	Asn	Gln	Glu	Lys	Ile		
145					150					155					160		
Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser	His	Lys	Val	Glu	Val	Lys	Asn		
			165					170						175			
Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln	Phe	Thr	Leu	Asp	Lys	Gly	Asp		
		180						185					190				
Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr	Ile	Glu	Gly	Asn	Gln	Trp	Leu		
	195					200						205					
Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg	Arg	Phe	Val	Leu	Leu	Gly	Lys		
	210					215					220						

Ala Ser Ser Val Glu Lys Thr Glu Asp Lys Glu Lys Val Ser Pro Gln

225					230					235				240	
Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly	Arg	Leu	Thr	Ile	Ser	Asn	Glu
				245					250					255	
Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile	Thr	Asn	Ile	Lys	Asp	Asp	Asn
			260					265					270		
Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val	Trp	Thr	Glu	Gln	Gly	Gly	Gln
		275					280					285			
Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val	Thr	Thr	Gly	Asp	Gly	Asn	Tyr
	290				295						300				
Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His	Lys	Asn	Glu	Lys	Gly	Leu	Tyr
305					310					315					320
Asn	Ile	His	Leu	Tyr	Tyr	Gln	Glu	Ala	Ser	Gly	Thr	Leu	Val	Gly	Val
			325						330					335	
Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly	Thr	Asn	Ser	Ser	Gln	Glu	Pro
			340					345					350		
Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly	Val	Tyr	Asn	Ile	Ile	Gly	Ser
		355					360					365			
Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile	Ser	Ser	Gln	Thr	Gln	Phe	Thr
	370					375					380				
Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr	Asp	Gln	Val	Leu	Thr	Ala	Asp
385					390					395					400
Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser	Tyr	Ser	Gly	Val	Arg	Arg	Tyr
			405						410					415	
Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser	Ser	Glu	Lys	Ala	Lys	Asp	Glu
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<210> 17
 <211> 441
 <212> PRT
 <213> Streptococcus agalactiae

<400> 17

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		20					25						30		
Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser	Asp	Lys	Val	Val	Asn	Ser	Gln
		35				40						45			
Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr	Pro	Leu	Val	Glu	Thr	Lys	Pro
	50				55						60				
Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln	Gly	Asn	Tyr	Val	Tyr	Ser	Lys
65					70				75					80	
Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser	Lys	Ser	Ala	Pro	Val	Ala	Phe
			85					90						95	
Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe	Tyr	Asp	Gln	Val	Phe	Asn	Lys
		100					105						110		
Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys	Ser	Phe	Cys	Gly	Val	Arg	Arg
		115				120						125			
Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro	Ser	Gly	Gly	Ser	Glu	Thr	Lys
	130					135					140				
Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly	Ser	Asn	Asn	Gln	Glu	Lys	Ile
145					150					155					160

Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser	His	Lys	Val	Glu	Val	Lys	Asn	
				165					170					175		
Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln	Phe	Thr	Leu	Asp	Lys	Gly	Asp	
			180					185					190			
Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr	Ile	Glu	Gly	Asn	Gln	Trp	Leu	
		195					200					205				
Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg	Arg	Phe	Val	Leu	Leu	Gly	Lys	
	210					215					220					
Ala	Ser	Ser	Val	Glu	Lys	Thr	Glu	Asp	Lys	Glu	Lys	Val	Ser	Pro	Gln	
225					230					235					240	
Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly	Arg	Leu	Thr	Ile	Ser	Asn	Glu	
			245						250					255		
Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile	Thr	Asn	Ile	Lys	Asp	Asp	Asn	
			260					265					270			
Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val	Trp	Thr	Glu	Gln	Gly	Gly	Gln	
	275						280					285				
Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val	Thr	Thr	Gly	Asp	Gly	Asn	Tyr	
	290					295					300					
Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His	Lys	Asn	Glu	Lys	Gly	Leu	Tyr	
305					310					315					320	
Asn	Ile	His	Leu	Tyr	Tyr	Gln	Glu	Ala	Ser	Gly	Thr	Leu	Val	Gly	Val	
			325						330					335		
Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly	Thr	Asn	Ser	Ser	Gln	Glu	Pro	
			340					345					350			
Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly	Val	Tyr	Asn	Ile	Ile	Gly	Ser	
	355						360					365				
Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile	Ser	Ser	Gln	Thr	Gln	Phe	Thr	
	370					375					380					
Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr	Asp	Gln	Val	Leu	Thr	Ala	Asp	
385					390					395					400	
Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser	Tyr	Ser	Gly	Val	Arg	Arg	Tyr	
			405						410					415		
Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser	Ser	Glu	Lys	Ala	Lys	Asp	Glu	
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Ala	Thr	Lys	Pro	Thr	Ser	Tyr	Pro	Asn								
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<210> 18

<211> 2670

<212> DNA

<213> Streptococcus agalactiae

<400> 18

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gtaattgtta	aaaaaacggg	agacaatgct	acaccattag	gcaaagcgac	ttttgtgtta	180
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acctttgaaa	acataaaacc	tggaactac	acattaagag	aagaaacagc	accaattggt	300
tataaaaaaa	ctgataaaac	ctggaaagtt	aaagttgcag	ataacggagc	aacaataatc	360
gagggtatgg	atgcagataa	agcagagaaa	cgaaaagaag	ttttgaatgc	ccaatatcca	420
aaatcagcta	tttatgagga	tacaaaagaa	aattacccat	tagttaatgt	agaggggtcc	480
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tataaaattg	aattaactgt	tgagggtaaa	accactgttg	aaacgaaaga	acttaatcaa	660
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gaagcgaccg tatcaaaggg agttgccgat caaaatggta aagcgctgaa tgatagtgtg      900
tcatgggatt atcataaaac tactttttaca gcaactacac ataattacag ttattttaa      960
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agtccagatg gctatataga ggttaaaacg aaacctgttg tgacatttac aattcaaaat     2460
ggagaagtta cgaacctgaa agcagatcca aatgctaata aaaatcaaat cgggtatctt     2520
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<210> 19
<211> 890
<212> PRT
<213> Streptococcus agalactiae

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 20          25          30
Asp Thr Asn Gln Ala Leu Gly Lys Val Ile Val Lys Lys Thr Gly Asp
 35          40          45
Asn Ala Thr Pro Leu Gly Lys Ala Thr Phe Val Leu Lys Asn Asp Asn
 50          55          60
Asp Lys Ser Glu Thr Ser His Glu Thr Val Glu Gly Ser Gly Glu Ala
 65          70          75          80
Thr Phe Glu Asn Ile Lys Pro Gly Asp Tyr Thr Leu Arg Glu Glu Thr
 85          90          95
Ala Pro Ile Gly Tyr Lys Lys Thr Asp Lys Thr Trp Lys Val Lys Val
100          105          110
Ala Asp Asn Gly Ala Thr Ile Ile Glu Gly Met Asp Ala Asp Lys Ala

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Asn	Lys	Tyr	Phe	Lys	Thr	Ile	Val	Glu	Glu	Lys	His	Ser	Ile	Val
			580					585					590	
Gly	Asn	Val	Thr	Asp	Pro	Met	Gly	Glu	Met	Ile	Glu	Phe	Gln	Leu
		595					600				605			
Asn	Gly	Gln	Ser	Phe	Thr	His	Asp	Asp	Tyr	Val	Leu	Val	Gly	Asn
	610					615				620				
Gly	Ser	Gln	Leu	Lys	Asn	Gly	Val	Ala	Leu	Gly	Gly	Pro	Asn	Ser
625					630					635				640
Gly	Gly	Ile	Leu	Lys	Asp	Val	Thr	Val	Thr	Tyr	Asp	Lys	Thr	Ser
				645					650					655
Thr	Ile	Lys	Ile	Asn	His	Leu	Asn	Leu	Gly	Ser	Gly	Gln	Lys	Val
			660				665						670	
Leu	Thr	Tyr	Asp	Val	Arg	Leu	Lys	Asp	Asn	Tyr	Ile	Ser	Asn	Lys
		675					680				685			
Tyr	Asn	Thr	Asn	Asn	Arg	Thr	Thr	Leu	Ser	Pro	Lys	Ser	Glu	Lys
	690					695					700			
Pro	Asn	Thr	Ile	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp	Val
705					710					715				720
Glu	Phe	Pro	Val	Leu	Thr	Ile	Ser	Asn	Gln	Lys	Lys	Met	Gly	Glu
			725						730					735
Glu	Phe	Ile	Lys	Val	Asn	Lys	Asp	Lys	His	Ser	Glu	Ser	Leu	Leu
		740					745						750	
Ala	Lys	Phe	Gln	Leu	Gln	Ile	Glu	Lys	Asp	Phe	Ser	Gly	Tyr	Lys
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Phe	Val	Pro	Glu	Gly	Ser	Asp	Val	Thr	Thr	Lys	Asn	Asp	Gly	Lys
	770					775					780			
Tyr	Phe	Lys	Ala	Leu	Gln	Asp	Gly	Asn	Tyr	Lys	Leu	Tyr	Glu	Ile
785					790				795					800
Ser	Pro	Asp	Gly	Tyr	Ile	Glu	Val	Lys	Thr	Lys	Pro	Val	Val	Thr
			805						810					815
Thr	Ile	Gln	Asn	Gly	Glu	Val	Thr	Asn	Leu	Lys	Ala	Asp	Pro	Asn
		820					825						830	
Asn	Lys	Asn	Gln	Ile	Gly	Tyr	Leu	Glu	Gly	Asn	Gly	Lys	His	Leu
	835						840					845		
Thr	Asn	Thr	Pro	Lys	Arg	Pro	Pro	Gly	Val	Phe	Pro	Lys	Thr	Gly
	850				855					860				
Ile	Gly	Thr	Ile	Val	Tyr	Ile	Leu	Val	Gly	Ser	Thr	Phe	Met	Ile
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 <212> PRT
 <213> Streptococcus agalactiae

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 20 25 30
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Ile	Lys	Thr	His	Gly	Glu	Pro	Thr	Thr	Leu	Tyr	Phe	Asn	Gly	Asn	Ile	485	490	495
Arg	Pro	Lys	Gly	Tyr	Asp	Ile	Phe	Thr	Val	Gly	Ile	Gly	Val	Asn	Gly	500	505	510
Asp	Pro	Gly	Ala	Thr	Pro	Leu	Glu	Ala	Glu	Lys	Phe	Met	Gln	Ser	Ile	515	520	525
Ser	Ser	Lys	Thr	Glu	Asn	Tyr	Thr	Asn	Val	Asp	Asp	Thr	Asn	Lys	Ile	530	535	540
Tyr	Asp	Glu	Leu	Asn	Lys	Tyr	Phe	Lys	Thr	Ile	Val	Glu	Glu	Lys	His	545	550	555
Ser	Ile	Val	Asp	Gly	Asn	Val	Thr	Asp	Pro	Met	Gly	Glu	Met	Ile	Glu	565	570	575
Phe	Gln	Leu	Lys	Asn	Gly	Gln	Ser	Phe	Thr	His	Asp	Asp	Tyr	Val	Leu	580	585	590
Val	Gly	Asn	Asp	Gly	Ser	Gln	Leu	Lys	Asn	Gly	Val	Ala	Leu	Gly	Gly	595	600	605
Pro	Asn	Ser	Asp	Gly	Gly	Ile	Leu	Lys	Asp	Val	Thr	Val	Thr	Tyr	Asp	610	615	620
Lys	Thr	Ser	Gln	Thr	Ile	Lys	Ile	Asn	His	Leu	Asn	Leu	Gly	Ser	Gly	625	630	635
Gln	Lys	Val	Val	Leu	Thr	Tyr	Asp	Val	Arg	Leu	Lys	Asp	Asn	Tyr	Ile	645	650	655
Ser	Asn	Lys	Phe	Tyr	Asn	Thr	Asn	Asn	Arg	Thr	Thr	Leu	Ser	Pro	Lys	660	665	670
Ser	Glu	Lys	Glu	Pro	Asn	Thr	Ile	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	675	680	685
Arg	Asp	Val	Arg	Glu	Phe	Pro	Val	Leu	Thr	Ile	Ser	Asn	Gln	Lys	Lys	690	695	700
Met	Gly	Glu	Val	Glu	Phe	Ile	Lys	Val	Asn	Lys	Asp	Lys	His	Ser	Glu	705	710	715
Ser	Leu	Leu	Gly	Ala	Lys	Phe	Gln	Leu	Gln	Ile	Glu	Lys	Asp	Phe	Ser	725	730	735
Gly	Tyr	Lys	Gln	Phe	Val	Pro	Glu	Gly	Ser	Asp	Val	Thr	Thr	Lys	Asn	740	745	750
Asp	Gly	Lys	Ile	Tyr	Phe	Lys	Ala	Leu	Gln	Asp	Gly	Asn	Tyr	Lys	Leu	755	760	765
Tyr	Glu	Ile	Ser	Ser	Pro	Asp	Gly	Tyr	Ile	Glu	Val	Lys	Thr	Lys	Pro	770	775	780
Val	Val	Thr	Phe	Thr	Ile	Gln	Asn	Gly	Glu	Val	Thr	Asn	Leu	Lys	Ala	785	790	795
Asp	Pro	Asn	Ala	Asn	Lys	Asn	Gln	Ile	Gly	Tyr	Leu	Glu	Gly	Asn	Gly	805	810	815
Lys	His	Leu	Ile	Thr	Asn	Thr	Pro	Lys	Arg	Pro	Pro	Gly	Val	Phe	Pro	820	825	830
Lys	Thr	Gly	Gly	Ile	Gly	Thr	Ile	Val	Tyr	Ile	Leu	Val	Gly	Ser	Thr	835	840	845
Phe	Met	Ile	Leu	Thr	Ile	Cys	Ser	Phe	Arg	Arg	Lys	Gln	Leu			850	855	860

<210> 21
 <211> 851
 <212> PRT
 <213> Streptococcus agalactiae

<400> 21

Gln	Ile	Val	Lys	Gly	Asp	Gly	Glu	Ser	Phe	Lys	Leu	Phe	Ser	Asp	Arg	
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Lys	Val	Pro	Val	Thr	Gly	Gly	Thr	Thr	Gln	Ala	Ala	Tyr	Arg	Val	Pro	
		450				455					460					
Gln	Asn	Gln	Leu	Ser	Val	Met	Ser	Asn	Glu	Gly	Tyr	Ala	Ile	Asn	Ser	
465					470					475					480	
Gly	Tyr	Ile	Tyr	Leu	Tyr	Trp	Arg	Asp	Tyr	Asn	Trp	Val	Tyr	Pro	Phe	
				485					490					495		
Asp	Pro	Lys	Thr	Lys	Lys	Val	Ser	Ala	Thr	Lys	Gln	Ile	Lys	Thr	His	
			500					505					510			
Gly	Glu	Pro	Thr	Thr	Leu	Tyr	Phe	Asn	Gly	Asn	Ile	Arg	Pro	Lys	Gly	
		515					520					525				
Tyr	Asp	Ile	Phe	Thr	Val	Gly	Ile	Gly	Val	Asn	Gly	Asp	Pro	Gly	Ala	
	530					535					540					
Thr	Pro	Leu	Glu	Ala	Glu	Lys	Phe	Met	Gln	Ser	Ile	Ser	Ser	Lys	Thr	
545					550					555					560	
Glu	Asn	Tyr	Thr	Asn	Val	Asp	Asp	Thr	Asn	Lys	Ile	Tyr	Asp	Glu	Leu	
				565					570					575		
Asn	Lys	Tyr	Phe	Lys	Thr	Ile	Val	Glu	Glu	Lys	His	Ser	Ile	Val	Asp	
			580					585					590			
Gly	Asn	Val	Thr	Asp	Pro	Met	Gly	Glu	Met	Ile	Glu	Phe	Gln	Leu	Lys	
		595				600						605				
Asn	Gly	Gln	Ser	Phe	Thr	His	Asp	Asp	Tyr	Val	Leu	Val	Gly	Asn	Asp	
	610					615					620					
Gly	Ser	Gln	Leu	Lys	Asn	Gly	Val	Ala	Leu	Gly	Gly	Pro	Asn	Ser	Asp	
625					630					635					640	
Gly	Gly	Ile	Leu	Lys	Asp	Val	Thr	Val	Thr	Tyr	Asp	Lys	Thr	Ser	Gln	
				645					650					655		
Thr	Ile	Lys	Ile	Asn	His	Leu	Asn	Leu	Gly	Ser	Gly	Gln	Lys	Val	Val	
			660					665					670			
Leu	Thr	Tyr	Asp	Val	Arg	Leu	Lys	Asp	Asn	Tyr	Ile	Ser	Asn	Lys	Phe	
		675					680					685				
Tyr	Asn	Thr	Asn	Asn	Arg	Thr	Thr	Leu	Ser	Pro	Lys	Ser	Glu	Lys	Glu	
	690					695					700					
Pro	Asn	Thr	Ile	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp	Val	Arg	
705					710					715					720	
Glu	Phe	Pro	Val	Leu	Thr	Ile	Ser	Asn	Gln	Lys	Lys	Met	Gly	Glu	Val	
				725					730					735		
Glu	Phe	Ile	Lys	Val	Asn	Lys	Asp	Lys	His	Ser	Glu	Ser	Leu	Leu	Gly	
			740					745					750			
Ala	Lys	Phe	Gln	Leu	Gln	Ile	Glu	Lys	Asp	Phe	Ser	Gly	Tyr	Lys	Gln	
		755					760					765				
Phe	Val	Pro	Glu	Gly	Ser	Asp	Val	Thr	Thr	Lys	Asn	Asp	Gly	Lys	Ile	
	770					775					780					
Tyr	Phe	Lys	Ala	Leu	Gln	Asp	Gly	Asn	Tyr	Lys	Leu	Tyr	Glu	Ile	Ser	
785					790					795					800	
Ser	Pro	Asp	Gly	Tyr	Ile	Glu	Val	Lys	Thr	Lys	Pro	Val	Val	Thr	Phe	
			805						810					815		
Thr	Ile	Gln	Asn	Gly	Glu	Val	Thr	Asn	Leu	Lys	Ala	Asp	Pro	Asn	Ala	
			820					825					830			
Asn	Lys	Asn	Gln	Ile	Gly	Tyr	Leu	Glu	Gly	Asn	Gly	Lys	His	Leu	Ile	
		835					840					845				
Thr	Asn	Thr														
		850														

<210> 22
 <211> 823
 <212> PRT
 <213> Streptococcus agalactiae

<400> 22
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 20 25 30
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 35 40 45
 Ser Gly Glu Ala Thr Phe Glu Asn Ile Lys Pro Gly Asp Tyr Thr Leu
 50 55 60
 Arg Glu Glu Thr Ala Pro Ile Gly Tyr Lys Lys Thr Asp Lys Thr Trp
 65 70 75 80
 Lys Val Lys Val Ala Asp Asn Gly Ala Thr Ile Ile Glu Gly Met Asp
 85 90 95
 Ala Asp Lys Ala Glu Lys Arg Lys Glu Val Leu Asn Ala Gln Tyr Pro
 100 105 110
 Lys Ser Ala Ile Tyr Glu Asp Thr Lys Glu Asn Tyr Pro Leu Val Asn
 115 120 125
 Val Glu Gly Ser Lys Val Gly Glu Gln Tyr Lys Ala Leu Asn Pro Ile
 130 135 140
 Asn Gly Lys Asp Gly Arg Arg Glu Ile Ala Glu Gly Trp Leu Ser Lys
 145 150 155 160
 Lys Ile Thr Gly Val Asn Asp Leu Asp Lys Asn Lys Tyr Lys Ile Glu
 165 170 175
 Leu Thr Val Glu Gly Lys Thr Thr Val Glu Thr Lys Glu Leu Asn Gln
 180 185 190
 Pro Leu Asp Val Val Val Leu Leu Asp Asn Ser Asn Ser Met Asn Asn
 195 200 205
 Glu Arg Ala Asn Asn Ser Gln Arg Ala Leu Lys Ala Gly Glu Ala Val
 210 215 220
 Glu Lys Leu Ile Asp Lys Ile Thr Ser Asn Lys Asp Asn Arg Val Ala
 225 230 235 240
 Leu Val Thr Tyr Ala Ser Thr Ile Phe Asp Gly Thr Glu Ala Thr Val
 245 250 255
 Ser Lys Gly Val Ala Asp Gln Asn Gly Lys Ala Leu Asn Asp Ser Val
 260 265 270
 Ser Trp Asp Tyr His Lys Thr Thr Phe Thr Ala Thr Thr His Asn Tyr
 275 280 285
 Ser Tyr Leu Asn Leu Thr Asn Asp Ala Asn Glu Val Asn Ile Leu Lys
 290 295 300
 Ser Arg Ile Pro Lys Glu Ala Glu His Ile Asn Gly Asp Arg Thr Leu
 305 310 315 320
 Tyr Gln Phe Gly Ala Thr Phe Thr Gln Lys Ala Leu Met Lys Ala Asn
 325 330 335
 Glu Ile Leu Glu Thr Gln Ser Ser Asn Ala Arg Lys Lys Leu Ile Phe
 340 345 350
 His Val Thr Asp Gly Val Pro Thr Met Ser Tyr Ala Ile Asn Phe Asn
 355 360 365
 Pro Tyr Ile Ser Thr Ser Tyr Gln Asn Gln Phe Asn Ser Phe Leu Asn

370		375		380
Lys Ile Pro Asp Arg Ser Gly Ile Leu Gln Glu Asp Phe Ile Ile Asn				
385		390		400
Gly Asp Asp Tyr Gln Ile Val Lys Gly Asp Gly Glu Ser Phe Lys Leu				
	405		410	415
Phe Ser Asp Arg Lys Val Pro Val Thr Gly Gly Thr Thr Gln Ala Ala				
	420		425	430
Tyr Arg Val Pro Gln Asn Gln Leu Ser Val Met Ser Asn Glu Gly Tyr				
	435		440	445
Ala Ile Asn Ser Gly Tyr Ile Tyr Leu Tyr Trp Arg Asp Tyr Asn Trp				
	450		455	460
Val Tyr Pro Phe Asp Pro Lys Thr Lys Lys Val Ser Ala Thr Lys Gln				
465		470		480
Ile Lys Thr His Gly Glu Pro Thr Thr Leu Tyr Phe Asn Gly Asn Ile				
	485		490	495
Arg Pro Lys Gly Tyr Asp Ile Phe Thr Val Gly Ile Gly Val Asn Gly				
	500		505	510
Asp Pro Gly Ala Thr Pro Leu Glu Ala Glu Lys Phe Met Gln Ser Ile				
	515		520	525
Ser Ser Lys Thr Glu Asn Tyr Thr Asn Val Asp Asp Thr Asn Lys Ile				
	530		535	540
Tyr Asp Glu Leu Asn Lys Tyr Phe Lys Thr Ile Val Glu Glu Lys His				
545		550		560
Ser Ile Val Asp Gly Asn Val Thr Asp Pro Met Gly Glu Met Ile Glu				
	565		570	575
Phe Gln Leu Lys Asn Gly Gln Ser Phe Thr His Asp Asp Tyr Val Leu				
	580		585	590
Val Gly Asn Asp Gly Ser Gln Leu Lys Asn Gly Val Ala Leu Gly Gly				
	595		600	605
Pro Asn Ser Asp Gly Gly Ile Leu Lys Asp Val Thr Val Thr Tyr Asp				
	610		615	620
Lys Thr Ser Gln Thr Ile Lys Ile Asn His Leu Asn Leu Gly Ser Gly				
625		630		640
Gln Lys Val Val Leu Thr Tyr Asp Val Arg Leu Lys Asp Asn Tyr Ile				
	645		650	655
Ser Asn Lys Phe Tyr Asn Thr Asn Asn Arg Thr Thr Leu Ser Pro Lys				
	660		665	670
Ser Glu Lys Glu Pro Asn Thr Ile Arg Asp Phe Pro Ile Pro Lys Ile				
	675		680	685
Arg Asp Val Arg Glu Phe Pro Val Leu Thr Ile Ser Asn Gln Lys Lys				
	690		695	700
Met Gly Glu Val Glu Phe Ile Lys Val Asn Lys Asp Lys His Ser Glu				
705		710		720
Ser Leu Leu Gly Ala Lys Phe Gln Leu Gln Ile Glu Lys Asp Phe Ser				
	725		730	735
Gly Tyr Lys Gln Phe Val Pro Glu Gly Ser Asp Val Thr Thr Lys Asn				
	740		745	750
Asp Gly Lys Ile Tyr Phe Lys Ala Leu Gln Asp Gly Asn Tyr Lys Leu				
	755		760	765
Tyr Glu Ile Ser Ser Pro Asp Gly Tyr Ile Glu Val Lys Thr Lys Pro				
	770		775	780
Val Val Thr Phe Thr Ile Gln Asn Gly Glu Val Thr Asn Leu Lys Ala				
785		790		800
Asp Pro Asn Ala Asn Lys Asn Gln Ile Gly Tyr Leu Glu Gly Asn Gly				

<213> Streptococcus agalactiae

<400> 25

Lys	Asp	Ser	Lys	Ile	Pro	Glu	Asn	Arg	Thr	Lys	Glu	Glu	Tyr	Gln	Ala
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Glu	Gln	Asn	Phe	Lys	Pro	Phe	Phe	Glu	Phe	Leu	Ala	Gln	Lys	Asp	Lys
		20						25					30		
Asp	Leu	Ser	Lys	Ile	Gln	Lys	Tyr	Leu	Leu	Leu	Val	Ser	Asp	Ser	Gly
	35						40					45			
Asp	Ala	Leu	Asp	Leu	Glu	Tyr	Phe	Tyr	Ser	Ile	Gln	Asp	Leu	Lys	Lys
	50					55					60				
Asn	Lys	Asp	Leu	Gly	Lys	Phe	Glu	Thr	Arg	Lys	Ser	Gln	Ile	Glu	Lys
65				70					75					80	
Pro	Gly	Gly	Tyr	Asn	Glu	Leu	Glu	Asn	Lys	Glu	Val	Pro	Phe	Glu	Tyr
				85					90					95	
Phe	Lys	Asn	Asn	Ile	Val	Tyr	Pro	Lys	Gly	Lys	Pro	Asn	Ile	Thr	Phe
		100						105					110		
Asp	Asp	Phe	Ile	Ile	Gly	Ala	Met	Asp	Thr	Lys	Glu	Leu	Lys	Glu	Leu
		115					120					125			
Lys	Lys	Leu	Lys	Val	Lys	Ser	Tyr	Leu	Leu	Lys	His	Pro	Glu	Thr	Glu
	130					135					140				
Leu	Lys	Asp	Ile	Thr	Tyr	Glu	Leu	Pro	Thr	Gln	Ser	Lys	Leu	Ile	Lys
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Lys															

<210> 26

<211> 3402

<212> DNA

<213> Streptococcus agalactiae

<400> 26

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accgaacaag	ccgtagaacc	cccacaacca	atagcagttt	ctgaggaatc	acgatcatca	180
aaggaaacta	aaacctcaca	aactcctagt	gatgtaggag	aaacagtagc	agatgacgct	240
aatgatctag	ccccctcaagc	tcctgctaaa	actgctgata	caccagcaac	ctcaaaagcg	300
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ggagctggga	ccgttggttg	agtgattgat	gctgggtttg	ataaaaaatca	tgaagcgtgg	420
cgcttaacag	acaaaactaa	agcacgttac	caatcaaaag	aaaatcttga	aaaagctaaa	480
aaagagcacg	gtattaccta	tggcgagtgg	gtcaatgata	aggtttgctta	ttaccacgac	540
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ttgtcaggaa	atgctccatc	tgaaatgaaa	gaaccttacc	gcctagaagg	tgcatgcct	660
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aagggcttcc	cgattgaatt	gccaaatgtt	gaccagatgc	ctgcggcctt	tatcagtcga	1320
agagacggtc	tcttattaaa	agacaatccc	ccaaaaacca	ttaccttcaa	tgcgacacct	1380

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gctgacggca	atattaaacc	ggatattgca	gcacccggcc	aagatatttt	gtcatcagtg	1500
gctaacaaca	agtatgccaa	actttctgga	actagtatgt	ctgcaccatt	ggtagcgggt	1560
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gatcaagcac	cagacaagaa	accagaagct	aaaccagaac	aagacggttc	aggtcaaaca	3180
ccagataaaa	aaaaagaaac	taaaccagaa	aaagatagtt	caggtcaaac	accaggtaaa	3240
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gctacaaaag	catcaacaag	agatcagtta	ccaacgacta	atgacaagga	tacaaatcgt	3360
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<210> 27

<211> 1134

<212> PRT

<213> Streptococcus agalactiae

<400> 27

Met	Arg	Lys	Lys	Gln	Lys	Leu	Pro	Phe	Asp	Lys	Leu	Ala	Ile	Ala	Leu
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Ile	Ser	Thr	Ser	Ile	Leu	Leu	Asn	Ala	Gln	Ser	Asp	Ile	Lys	Ala	Asn
			20				25					30			
Thr	Val	Thr	Glu	Asp	Thr	Pro	Ala	Thr	Glu	Gln	Ala	Val	Glu	Pro	Pro
			35				40					45			
Gln	Pro	Ile	Ala	Val	Ser	Glu	Glu	Ser	Arg	Ser	Ser	Lys	Glu	Thr	Lys
			50			55					60				
Thr	Ser	Gln	Thr	Pro	Ser	Asp	Val	Gly	Glu	Thr	Val	Ala	Asp	Asp	Ala
65					70				75					80	
Asn	Asp	Leu	Ala	Pro	Gln	Ala	Pro	Ala	Lys	Thr	Ala	Asp	Thr	Pro	Ala
				85				90						95	
Thr	Ser	Lys	Ala	Thr	Ile	Arg	Asp	Leu	Asn	Asp	Pro	Ser	His	Val	Lys

			100					105				110					
Thr	Leu	Gln	Glu	Lys	Ala	Gly	Lys	Gly	Ala	Gly	Thr	Val	Val	Ala	Val		
		115						120				125					
Ile	Asp	Ala	Gly	Phe	Asp	Lys	Asn	His	Glu	Ala	Trp	Arg	Leu	Thr	Asp		
	130					135					140						
Lys	Thr	Lys	Ala	Arg	Tyr	Gln	Ser	Lys	Glu	Asn	Leu	Glu	Lys	Ala	Lys		
145					150					155					160		
Lys	Glu	His	Gly	Ile	Thr	Tyr	Gly	Glu	Trp	Val	Asn	Asp	Lys	Val	Ala		
			165						170					175			
Tyr	Tyr	His	Asp	Tyr	Ser	Lys	Asp	Gly	Lys	Asn	Ala	Val	Asp	Gln	Glu		
		180						185					190				
His	Gly	Thr	His	Val	Ser	Gly	Ile	Leu	Ser	Gly	Asn	Ala	Pro	Ser	Glu		
	195						200					205					
Met	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly	Ala	Met	Pro	Glu	Ala	Gln	Leu		
	210					215					220						
Leu	Leu	Met	Arg	Val	Glu	Ile	Val	Asn	Gly	Leu	Ala	Asp	Tyr	Ala	Arg		
225					230					235					240		
Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala	Val	Asn	Leu	Gly	Ala	Lys	Val		
			245						250					255			
Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala	Leu	Ala	Tyr	Ala	Asn	Leu	Pro		
		260					265						270				
Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr	Ala	Lys	Ser	Lys	Gly	Val	Ser		
	275						280					285					
Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser	Ser	Phe	Gly	Gly	Lys	Pro	Arg		
	290					295					300						
Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr	Gly	Val	Val	Gly	Thr	Pro	Ala		
305					310					315					320		
Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val	Ala	Ser	Tyr	Ser	Pro	Asp	Lys	Gln		
			325						330					335			
Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys	Thr	Asp	Asp	His	Gln	Asp	Lys	Glu		
		340					345					350					
Met	Pro	Val	Ile	Ser	Thr	Asn	Arg	Phe	Glu	Pro	Asn	Lys	Ala	Tyr	Asp		
	355					360						365					
Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr	Lys	Glu	Asp	Asp	Phe	Lys	Asp	Val		
	370					375					380						
Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Asp	Ile	Asp	Phe	Lys	Asp		
385					390					395					400		
Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala	Gly	Ala	Val	Gly	Val	Leu	Ile	Tyr		
			405						410					415			
Asp	Asn	Gln	Asp	Lys	Gly	Phe	Pro	Ile	Glu	Leu	Pro	Asn	Val	Asp	Gln		
		420						425					430				
Met	Pro	Ala	Ala	Phe	Ile	Ser	Arg	Arg	Asp	Gly	Leu	Leu	Leu	Lys	Asp		
	435					440						445					
Asn	Pro	Pro	Lys	Thr	Ile	Thr	Phe	Asn	Ala	Thr	Pro	Lys	Val	Leu	Pro		
	450					455						460					
Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser	Arg	Phe	Ser	Ser	Trp	Gly	Leu	Thr		
465					470					475					480		
Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp	Ile	Ala	Ala	Pro	Gly	Gln	Asp	Ile		
			485						490					495			
Leu	Ser	Ser	Val	Ala	Asn	Asn	Lys	Tyr	Ala	Lys	Leu	Ser	Gly	Thr	Ser		
		500						505					510				
Met	Ser	Ala	Pro	Leu	Val	Ala	Gly	Ile	Met	Gly	Leu	Leu	Gln	Lys	Gln		
	515						520					525					
Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met	Thr	Pro	Ser	Glu	Arg	Leu	Asp	Leu		
	530					535					540						

Ala	Lys	Lys	Val	Leu	Met	Ser	Ser	Ala	Thr	Ala	Leu	Tyr	Asp	Glu	Asp	545	550	555	560
Glu	Lys	Ala	Tyr	Phe	Ser	Pro	Arg	Gln	Gln	Gly	Ala	Gly	Ala	Val	Asp	565	570		575
Ala	Lys	Lys	Ala	Ser	Ala	Ala	Thr	Met	Tyr	Val	Thr	Asp	Lys	Asp	Asn	580	585		590
Thr	Ser	Ser	Lys	Val	His	Leu	Asn	Asn	Val	Ser	Asp	Lys	Phe	Glu	Val	595	600		605
Thr	Val	Thr	Val	His	Asn	Lys	Ser	Asp	Lys	Pro	Gln	Glu	Leu	Tyr	Tyr	610	615		620
Gln	Val	Thr	Val	Gln	Thr	Asp	Lys	Val	Asp	Gly	Lys	His	Phe	Ala	Leu	625	630		640
Ala	Pro	Lys	Ala	Leu	Tyr	Glu	Thr	Ser	Trp	Gln	Lys	Ile	Thr	Ile	Pro	645	650		655
Ala	Asn	Ser	Ser	Lys	Gln	Val	Thr	Val	Pro	Ile	Asp	Ala	Ser	Arg	Phe	660	665		670
Ser	Lys	Asp	Leu	Leu	Ala	Gln	Met	Lys	Asn	Gly	Tyr	Phe	Leu	Glu	Gly	675	680		685
Phe	Val	Arg	Phe	Lys	Gln	Asp	Pro	Thr	Lys	Glu	Glu	Leu	Met	Ser	Ile	690	695		700
Pro	Tyr	Ile	Gly	Phe	Arg	Gly	Asp	Phe	Gly	Asn	Leu	Ser	Ala	Leu	Glu	705	710		720
Lys	Pro	Ile	Tyr	Asp	Ser	Lys	Asp	Gly	Ser	Ser	Tyr	Tyr	His	Glu	Ala	725	730		735
Asn	Ser	Asp	Ala	Lys	Asp	Gln	Leu	Asp	Gly	Asp	Gly	Leu	Gln	Phe	Tyr	740	745		750
Ala	Leu	Lys	Asn	Asn	Phe	Thr	Ala	Leu	Thr	Thr	Glu	Ser	Asn	Pro	Trp	755	760		765
Thr	Ile	Ile	Lys	Ala	Val	Lys	Glu	Gly	Val	Glu	Asn	Ile	Glu	Asp	Ile	770	775		780
Glu	Ser	Ser	Glu	Ile	Thr	Glu	Thr	Ile	Phe	Ala	Gly	Thr	Phe	Ala	Lys	785	790		800
Gln	Asp	Asp	Asp	Ser	His	Tyr	Tyr	Ile	His	Arg	His	Ala	Asn	Gly	Lys	805	810		815
Pro	Tyr	Ala	Ala	Ile	Ser	Pro	Asn	Gly	Asp	Gly	Asn	Arg	Asp	Tyr	Val	820	825		830
Gln	Phe	Gln	Gly	Thr	Phe	Leu	Arg	Asn	Ala	Lys	Asn	Leu	Val	Ala	Glu	835	840		845
Val	Leu	Asp	Lys	Glu	Gly	Asn	Val	Val	Trp	Thr	Ser	Glu	Val	Thr	Glu	850	855		860
Gln	Val	Val	Lys	Asn	Tyr	Asn	Asn	Asp	Leu	Ala	Ser	Thr	Leu	Gly	Ser	865	870		880
Thr	Arg	Phe	Glu	Lys	Thr	Arg	Trp	Asp	Gly	Lys	Asp	Lys	Asp	Gly	Lys	885	890		895
Val	Val	Ala	Asn	Gly	Thr	Tyr	Thr	Tyr	Arg	Val	Arg	Tyr	Thr	Pro	Ile	900	905		910
Ser	Ser	Gly	Ala	Lys	Glu	Gln	His	Thr	Asp	Phe	Asp	Val	Ile	Val	Asp	915	920		925
Asn	Thr	Thr	Pro	Glu	Val	Ala	Thr	Ser	Ala	Thr	Phe	Ser	Thr	Glu	Asp	930	935		940
Ser	Arg	Leu	Thr	Leu	Ala	Ser	Lys	Pro	Lys	Thr	Ser	Gln	Pro	Val	Tyr	945	950		960
Arg	Glu	Arg	Ile	Ala	Tyr	Thr	Tyr	Met	Asp	Glu	Asp	Leu	Pro	Thr	Thr	965	970		975
Glu	Tyr	Ile	Ser	Pro	Asn	Glu	Asp	Gly	Thr	Phe	Thr	Leu	Pro	Glu	Glu				

225					230					235				240
Leu	Ala	Tyr	Ala	Asn	Leu	Pro	Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp
				245					250					255
Ala	Lys	Ser	Lys	Gly	Val	Ser	Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp
			260					265					270	
Ser	Phe	Gly	Gly	Lys	Pro	Arg	Leu	Pro	Leu	Ala	Asp	His	Pro	Asp
		275					280					285		
Gly	Val	Val	Gly	Thr	Pro	Ala	Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val
	290					295					300			
Ser	Tyr	Ser	Pro	Asp	Lys	Gln	Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys
305					310					315				320
Asp	Asp	His	Gln	Asp	Lys	Glu	Met	Pro	Val	Ile	Ser	Thr	Asn	Arg
				325					330					335
Glu	Pro	Asn	Lys	Ala	Tyr	Asp	Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr
			340					345					350	
Glu	Asp	Asp	Phe	Lys	Asp	Val	Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu
		355					360					365		
Gly	Asp	Ile	Asp	Phe	Lys	Asp	Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala
	370					375					380			
Ala	Val	Gly	Val	Leu	Ile	Tyr	Asp	Asn	Gln	Asp	Lys	Gly	Phe	Pro
385					390					395				400
Glu	Leu	Pro	Asn	Val	Asp	Gln	Met	Pro	Ala	Ala	Phe	Ile	Ser	Arg
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Asp	Gly	Leu	Leu	Leu	Lys	Asp	Asn	Pro	Pro	Lys	Thr	Ile	Thr	Phe
		420					425						430	
Ala	Thr	Pro	Lys	Val	Leu	Pro	Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser
		435					440					445		
Phe	Ser	Ser	Trp	Gly	Leu	Thr	Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp
	450				455					460				
Ala	Ala	Pro	Gly	Gln	Asp	Ile	Leu	Ser	Ser	Val	Ala	Asn	Asn	Lys
465					470					475				480
Ala	Lys	Leu	Ser	Gly	Thr	Ser	Met	Ser	Ala	Pro	Leu	Val	Ala	Gly
				485					490					495
Met	Gly	Leu	Leu	Gln	Lys	Gln	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met
		500						505					510	
Pro	Ser	Glu	Arg	Leu	Asp	Leu	Ala	Lys	Lys	Val	Leu	Met	Ser	Ser
		515					520					525		
Thr	Ala	Leu	Tyr	Asp	Glu	Asp	Glu	Lys	Ala	Tyr	Phe	Ser	Pro	Arg
	530					535					540			
Gln	Gly	Ala	Gly	Ala	Val	Asp	Ala	Lys	Lys	Ala	Ser	Ala	Ala	Thr
545					550					555				560
Tyr	Val	Thr	Asp	Lys	Asp	Asn	Thr	Ser	Ser	Lys	Val	His	Leu	Asn
				565					570					575
Val	Ser	Asp	Lys	Phe	Glu	Val	Thr	Val	Thr	Val	His	Asn	Lys	Ser
		580						585					590	
Lys	Pro	Gln	Glu	Leu	Tyr	Tyr	Gln	Val	Thr	Val	Gln	Thr	Asp	Lys
		595					600					605		
Asp	Gly	Lys	His	Phe	Ala	Leu	Ala	Pro	Lys	Ala	Leu	Tyr	Glu	Thr
	610					615					620			
Trp	Gln	Lys	Ile	Thr	Ile	Pro	Ala	Asn	Ser	Ser	Lys	Gln	Val	Thr
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Pro	Ile	Asp	Ala	Ser	Arg	Phe	Ser	Lys	Asp	Leu	Leu	Ala	Gln	Met
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Asn	Gly	Tyr	Phe	Leu	Glu	Gly	Phe	Val	Arg	Phe	Lys	Gln	Asp	Pro
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 Gly Asn Leu Ser Ala Leu Glu Lys Pro Ile Tyr Asp Ser Lys Asp Gly
 690 695 700
 Ser Ser Tyr Tyr His Glu Ala Asn Ser Asp Ala Lys Asp Gln Leu Asp
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 Gly Asp Gly Leu Gln Phe Tyr Ala Leu Lys Asn Asn Phe Thr Ala Leu
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 Thr Thr Glu Ser Asn Pro Trp Thr Ile Lys Ala Val Lys Glu Gly
 740 745 750
 Val Glu Asn Ile Glu Asp Ile Glu Ser Ser Glu Ile Thr Glu Thr Ile
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 Phe Ala Gly Thr Phe Ala Lys Gln Asp Asp Asp Ser His Tyr Tyr Ile
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 His Arg His Ala Asn Gly Lys Pro Tyr Ala Ala Ile Ser Pro Asn Gly
 785 790 795 800
 Asp Gly Asn Arg Asp Tyr Val Gln Phe Gln Gly Thr Phe Leu Arg Asn
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 Ala Lys Asn Leu Val Ala Glu Val Leu Asp Lys Glu Gly Asn Val Val
 820 825 830
 Trp Thr Ser Glu Val Thr Glu Gln Val Val Lys Asn Tyr Asn Asn Asp
 835 840 845
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 850 855 860
 Gly Lys Asp Lys Asp Gly Lys Val Val Ala Asn Gly Thr Tyr Thr Tyr
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 Asp Phe Asp Val Ile Val Asp Asn Thr Thr Pro Glu Val Ala Thr Ser
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 930 935 940
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 945 950 955 960
 Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val
 965 970 975
 Pro Leu Lys Met Ser Asp Phe Thr Tyr Val Val Glu Asp Met Ala Gly
 980 985 990
 Asn Ile Thr Tyr Thr Pro Val Thr Lys Leu Leu Glu Gly His Ser Asn
 995 1000 1005
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 Ala Lys Pro Glu Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Lys Lys
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 Glu Thr Lys Pro Glu Lys Asp Ser Ser Gly Gln Thr Pro Gly Lys Thr
 1045 1050 1055
 Pro Gln Lys Gly Gln Ser Ser Arg Thr Leu Glu Lys Arg Ser Ser Lys
 1060 1065 1070
 Arg Ala Leu Ala Thr Lys Ala Ser Thr Arg Asp Gln Leu Pro Thr Thr
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 Asn Asp Lys Asp Thr Asn Arg Leu His Leu Leu Lys Leu Val Met Thr
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 Thr Phe Phe Leu Gly

1105

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<211> 1103

<212> PRT

<213> Streptococcus agalactiae

<400> 29

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Ile	Ser	Thr	Ser	Ile	Leu	Leu	Asn	Ala	Gln	Ser	Asp	Ile	Lys	Ala	Asn
			20					25					30		
Thr	Val	Thr	Glu	Asp	Thr	Pro	Ala	Thr	Glu	Gln	Ala	Val	Glu	Pro	Pro
		35					40					45			
Gln	Pro	Ile	Ala	Val	Ser	Glu	Glu	Ser	Arg	Ser	Ser	Lys	Glu	Thr	Lys
	50					55					60				
Thr	Ser	Gln	Thr	Pro	Ser	Asp	Val	Gly	Glu	Thr	Val	Ala	Asp	Asp	Ala
65					70					75					80
Asn	Asp	Leu	Ala	Pro	Gln	Ala	Pro	Ala	Lys	Thr	Ala	Asp	Thr	Pro	Ala
				85					90					95	
Thr	Ser	Lys	Ala	Thr	Ile	Arg	Asp	Leu	Asn	Asp	Pro	Ser	His	Val	Lys
			100					105					110		
Thr	Leu	Gln	Glu	Lys	Ala	Gly	Lys	Gly	Ala	Gly	Thr	Val	Val	Ala	Val
		115					120					125			
Ile	Asp	Ala	Gly	Phe	Asp	Lys	Asn	His	Glu	Ala	Trp	Arg	Leu	Thr	Asp
	130					135					140				
Lys	Thr	Lys	Ala	Arg	Tyr	Gln	Ser	Lys	Glu	Asn	Leu	Glu	Lys	Ala	Lys
145					150					155					160
Lys	Glu	His	Gly	Ile	Thr	Tyr	Gly	Glu	Trp	Val	Asn	Asp	Lys	Val	Ala
				165					170					175	
Tyr	Tyr	His	Asp	Tyr	Ser	Lys	Asp	Gly	Lys	Asn	Ala	Val	Asp	Gln	Glu
			180					185					190		
His	Gly	Thr	His	Val	Ser	Gly	Ile	Leu	Ser	Gly	Asn	Ala	Pro	Ser	Glu
		195					200					205			
Met	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly	Ala	Met	Pro	Glu	Ala	Gln	Leu
	210					215					220				
Leu	Leu	Met	Arg	Val	Glu	Ile	Val	Asn	Gly	Leu	Ala	Asp	Tyr	Ala	Arg
225					230					235					240
Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala	Val	Asn	Leu	Gly	Ala	Lys	Val
				245					250					255	
Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala	Leu	Ala	Tyr	Ala	Asn	Leu	Pro
			260					265					270		
Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr	Ala	Lys	Ser	Lys	Gly	Val	Ser
		275					280					285			
Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser	Ser	Phe	Gly	Gly	Lys	Pro	Arg
	290					295					300				
Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr	Gly	Val	Val	Gly	Thr	Pro	Ala
305					310					315					320
Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val	Ala	Ser	Tyr	Ser	Pro	Asp	Lys	Gln
				325					330					335	
Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys	Thr	Asp	Asp	His	Gln	Asp	Lys	Glu
			340					345					350		
Met	Pro	Val	Ile	Ser	Thr	Asn	Arg	Phe	Glu	Pro	Asn	Lys	Ala	Tyr	Asp
		355					360					365			
Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr	Lys	Glu	Asp	Asp	Phe	Lys	Asp	Val

370		375		380
Glu Gly Lys Ile Ala	Leu Ile Glu Arg Gly Asp	Ile Asp Phe Lys Asp		
385	390	395	400	
Lys Ile Ala Asn Ala	Lys Lys Ala Gly Ala Val	Gly Val Leu Ile Tyr		
	405	410	415	
Asp Asn Gln Asp Lys	Gly Phe Pro Ile Glu Leu	Pro Asn Val Asp Gln		
	420	425	430	
Met Pro Ala Ala Phe	Ile Ser Arg Arg Asp Gly	Leu Leu Leu Lys Asp		
	435	440	445	
Asn Pro Pro Lys Thr	Ile Thr Phe Asn Ala Thr	Pro Lys Val Leu Pro		
	450	455	460	
Thr Ala Ser Gly Thr	Lys Leu Ser Arg Phe Ser	Ser Trp Gly Leu Thr		
465	470	475	480	
Ala Asp Gly Asn Ile	Lys Pro Asp Ile Ala Ala	Pro Gly Gln Asp Ile		
	485	490	495	
Leu Ser Ser Val Ala	Asn Asn Lys Tyr Ala Lys	Leu Ser Gly Thr Ser		
	500	505	510	
Met Ser Ala Pro Leu	Val Ala Gly Ile Met Gly	Leu Leu Gln Lys Gln		
	515	520	525	
Tyr Glu Thr Gln Tyr	Pro Asp Met Thr Pro Ser	Glu Arg Leu Asp Leu		
	530	535	540	
Ala Lys Lys Val Leu	Met Ser Ser Ala Thr Ala	Leu Tyr Asp Glu Asp		
545	550	555	560	
Glu Lys Ala Tyr Phe	Ser Pro Arg Gln Gln Gly	Ala Gly Ala Val Asp		
	565	570	575	
Ala Lys Lys Ala Ser	Ala Ala Thr Met Tyr Val	Thr Asp Lys Asp Asn		
	580	585	590	
Thr Ser Ser Lys Val	His Leu Asn Val Ser Asp	Lys Phe Glu Val		
	595	600	605	
Thr Val Thr Val His	Asn Lys Ser Asp Lys Pro	Gln Glu Leu Tyr Tyr		
	610	615	620	
Gln Val Thr Val Gln	Thr Asp Lys Val Asp Gly	Lys His Phe Ala Leu		
625	630	635	640	
Ala Pro Lys Ala Leu	Tyr Glu Thr Ser Trp Gln	Lys Ile Thr Ile Pro		
	645	650	655	
Ala Asn Ser Ser Lys	Gln Val Thr Val Pro Ile	Asp Ala Ser Arg Phe		
	660	665	670	
Ser Lys Asp Leu Leu	Ala Gln Met Lys Asn Gly	Tyr Phe Leu Glu Gly		
	675	680	685	
Phe Val Arg Phe Lys	Gln Asp Pro Thr Lys Glu	Glu Leu Met Ser Ile		
	690	695	700	
Pro Tyr Ile Gly Phe	Arg Gly Asp Phe Gly Asn	Leu Ser Ala Leu Glu		
705	710	715	720	
Lys Pro Ile Tyr Asp	Ser Lys Asp Gly Ser Ser	Tyr Tyr His Glu Ala		
	725	730	735	
Asn Ser Asp Ala Lys	Asp Gln Leu Asp Gly Asp	Gly Leu Gln Phe Tyr		
	740	745	750	
Ala Leu Lys Asn Asn	Phe Thr Ala Leu Thr Thr	Glu Ser Asn Pro Trp		
	755	760	765	
Thr Ile Ile Lys Ala	Val Lys Glu Gly Val Glu	Asn Ile Glu Asp Ile		
	770	775	780	
Glu Ser Ser Glu Ile	Thr Glu Thr Ile Phe Ala	Gly Thr Phe Ala Lys		
785	790	795	800	
Gln Asp Asp Asp Ser	His Tyr Tyr Ile His	Arg His Ala Asn Gly	Lys	

Asn	Asp	Pro	Ser	His	Val	Lys	Thr	Leu	Gln	Glu	Lys	Ala	Gly	Lys	Gly		
				85					90					95			
Ala	Gly	Thr	Val	Val	Ala	Val	Ile	Asp	Ala	Gly	Phe	Asp	Lys	Asn	His		
			100					105					110				
Glu	Ala	Trp	Arg	Leu	Thr	Asp	Lys	Thr	Lys	Ala	Arg	Tyr	Gln	Ser	Lys		
		115					120					125					
Glu	Asn	Leu	Glu	Lys	Ala	Lys	Lys	Glu	His	Gly	Ile	Thr	Tyr	Gly	Glu		
	130					135					140						
Trp	Val	Asn	Asp	Lys	Val	Ala	Tyr	Tyr	His	Asp	Tyr	Ser	Lys	Asp	Gly		
	145				150					155					160		
Lys	Asn	Ala	Val	Asp	Gln	Glu	His	Gly	Thr	His	Val	Ser	Gly	Ile	Leu		
			165					170						175			
Ser	Gly	Asn	Ala	Pro	Ser	Glu	Met	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly		
		180						185					190				
Ala	Met	Pro	Glu	Ala	Gln	Leu	Leu	Leu	Met	Arg	Val	Glu	Ile	Val	Asn		
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Gly	Leu	Ala	Asp	Tyr	Ala	Arg	Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala		
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Val	Asn	Leu	Gly	Ala	Lys	Val	Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala		
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Leu	Ala	Tyr	Ala	Asn	Leu	Pro	Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr		
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Ala	Lys	Ser	Lys	Gly	Val	Ser	Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser		
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Ser	Phe	Gly	Gly	Lys	Pro	Arg	Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr		
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Glu	Pro	Asn	Lys	Ala	Tyr	Asp	Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr	Lys		
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Glu	Asp	Asp	Phe	Lys	Asp	Val	Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg		
	355					360						365					
Gly	Asp	Ile	Asp	Phe	Lys	Asp	Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala	Gly		
	370				375				380								
Ala	Val	Gly	Val	Leu	Ile	Tyr	Asp	Asn	Gln	Asp	Lys	Gly	Phe	Pro	Ile		
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			405					410						415			
Asp	Gly	Leu	Leu	Leu	Lys	Asp	Asn	Pro	Pro	Lys	Thr	Ile	Thr	Phe	Asn		
		420					425						430				
Ala	Thr	Pro	Lys	Val	Leu	Pro	Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser	Arg		
	435					440						445					
Phe	Ser	Ser	Trp	Gly	Leu	Thr	Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp	Ile		
	450				455					460							
Ala	Ala	Pro	Gly	Gln	Asp	Ile	Leu	Ser	Ser	Val	Ala	Asn	Asn	Lys	Tyr		
	465				470				475						480		
Ala	Lys	Leu	Ser	Gly	Thr	Ser	Met	Ser	Ala	Pro	Leu	Val	Ala	Gly	Ile		
			485					490						495			
Met	Gly	Leu	Leu	Gln	Lys	Gln	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met	Thr		
		500					505					510					
Pro	Ser	Glu	Arg	Leu	Asp	Leu	Ala	Lys	Lys	Val	Leu	Met	Ser	Ser	Ala		

Asp	Glu	Asp	Leu	Pro	Thr	Thr	Glu	Tyr	Ile	Ser	Pro	Asn	Glu	Asp	Gly	
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Thr	Phe	Thr	Leu	Pro	Glu	Glu	Ala	Glu	Thr	Met	Glu	Gly	Ala	Thr	Val	
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Asn	Ile	Thr	Tyr	Thr	Pro	Val	Thr	Lys	Leu	Leu	Glu	Gly	His	Ser	Asn	
	995						1000					1005				
Lys	Pro	Glu	Gln	Asp	Gly	Ser	Asp	Gln	Ala	Pro	Asp	Lys	Lys	Pro	Glu	
	1010					1015					1020					
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catgggtctt	ttgaagatta	tggtgctgca	aaatggaata	tccaaaatca	aatgtcttca	660
tctgattttt	tggtacttaa	ttttaatcaa	ggtattttcta	aagagtttagc	taaaactact	720
aaagcaacaa	tcgttccttt	ctctactacg	gaaaaagttg	atggtgctta	cgtacaagac	780
aagcaacttt	tctataaagg	ggagaatatt	atgtcagtag	atgacattgg	tgtcccagga	840
agccataacg	tagagaatgc	tctagcaact	attgcggttg	ctaaactggc	tggtatcagt	900
aatcaagtta	ttagagaaac	tttaagcaat	tttgagggtg	ttaaaccaccg	cttgcaatca	960
ctcggttaagg	ttcatggtat	tagttttctat	aacgacagca	agtcaactaa	tatattggca	1020
actcaaaaag	cattatctgg	ctttgataat	actaaagtta	tcctaattgc	aggaggtctt	1080
gatcgcggtg	atgagtttga	tgaattgata	ccagatatca	ctggacttaa	acatatgggt	1140
gttttagggg	aatcggcatc	tcgagtaaaa	cgtgctgcac	aaaaagcagg	agtaacttat	1200
agcgatgctt	tagatgttag	agatgcggta	cataaagctt	atgaggtggc	acaacagggc	1260
gatgttatct	tgctaagtcc	tgcaaatgca	tcatgggaca	tgtataagaa	tttcgaagtc	1320
cgtgggtgatg	aattcattga	tacttttcgaa	agtccttagag	gagag		1365

<210> 32
 <211> 455
 <212> PRT
 <213> Streptococcus agalactiae

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<400> 32
Met Gly Arg Val Met Lys Thr Ile Thr Thr Phe Glu Asn Lys Lys Val
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Leu Val Leu Gly Leu Ala Arg Ser Gly Glu Ala Ala Ala Arg Leu Leu
 20      25      30
Ala Lys Leu Gly Ala Ile Val Thr Val Asn Asp Gly Lys Pro Phe Asp
 35      40      45
Glu Asn Pro Thr Ala Gln Ser Leu Leu Glu Glu Gly Ile Lys Val Val
 50      55      60
Cys Gly Ser His Pro Leu Glu Leu Leu Asp Glu Asp Phe Cys Tyr Met
 65      70      75      80
Ile Lys Asn Pro Gly Ile Pro Tyr Asn Asn Pro Met Val Lys Lys Ala
 85      90      95
Leu Glu Lys Gln Ile Pro Val Leu Thr Glu Val Glu Leu Ala Tyr Leu
 100     105     110
Val Ser Glu Ser Gln Leu Ile Gly Ile Thr Gly Ser Asn Gly Lys Thr
 115     120     125
Thr Thr Thr Thr Met Ile Ala Glu Val Leu Asn Ala Gly Gly Gln Arg
 130     135     140
Gly Leu Leu Ala Gly Asn Ile Gly Phe Pro Ala Ser Glu Val Val Gln
 145     150     155     160
Ala Ala Asn Asp Lys Asp Thr Leu Val Met Glu Leu Ser Ser Phe Gln
 165     170     175
Leu Met Gly Val Lys Glu Phe Arg Pro His Ile Ala Val Ile Thr Asn
 180     185     190
Leu Met Pro Thr His Leu Asp Tyr His Gly Ser Phe Glu Asp Tyr Val
 195     200     205
Ala Ala Lys Trp Asn Ile Gln Asn Gln Met Ser Ser Ser Asp Phe Leu
 210     215     220
Val Leu Asn Phe Asn Gln Gly Ile Ser Lys Glu Leu Ala Lys Thr Thr
 225     230     235     240
Lys Ala Thr Ile Val Pro Phe Ser Thr Thr Glu Lys Val Asp Gly Ala
 245     250     255
Tyr Val Gln Asp Lys Gln Leu Phe Tyr Lys Gly Glu Asn Ile Met Ser
 260     265     270
Val Asp Asp Ile Gly Val Pro Gly Ser His Asn Val Glu Asn Ala Leu
 275     280     285
Ala Thr Ile Ala Val Ala Lys Leu Ala Gly Ile Ser Asn Gln Val Ile
 290     295     300
Arg Glu Thr Leu Ser Asn Phe Gly Gly Val Lys His Arg Leu Gln Ser
 305     310     315     320
Leu Gly Lys Val His Gly Ile Ser Phe Tyr Asn Asp Ser Lys Ser Thr
 325     330     335
Asn Ile Leu Ala Thr Gln Lys Ala Leu Ser Gly Phe Asp Asn Thr Lys
 340     345     350
Val Ile Leu Ile Ala Gly Gly Leu Asp Arg Gly Asn Glu Phe Asp Glu
 355     360     365
Leu Ile Pro Asp Ile Thr Gly Leu Lys His Met Val Val Leu Gly Glu
 370     375     380
Ser Ala Ser Arg Val Lys Arg Ala Ala Gln Lys Ala Gly Val Thr Tyr
 385     390     395     400
Ser Asp Ala Leu Asp Val Arg Asp Ala Val His Lys Ala Tyr Glu Val
 405     410     415
Ala Gln Gln Gly Asp Val Ile Leu Leu Ser Pro Ala Asn Ala Ser Trp
 420     425     430

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Asp Met Tyr Lys Asn Phe Glu Val Arg Gly Asp Glu Phe Ile Asp Thr
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Phe Glu Ser Leu Arg Gly Glu
450 455

<210> 33
<211> 448
<212> PRT
<213> Streptococcus agalactiae

<400> 33
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Ser Gly Glu Ala Ala Ala Arg Leu Leu Ala Lys Leu Gly Ala Ile Val
20 25 30
Thr Val Asn Asp Gly Lys Pro Phe Asp Glu Asn Pro Thr Ala Gln Ser
35 40 45
Leu Leu Glu Glu Gly Ile Lys Val Val Cys Gly Ser His Pro Leu Glu
50 55 60
Leu Leu Asp Glu Asp Phe Cys Tyr Met Ile Lys Asn Pro Gly Ile Pro
65 70 75 80
Tyr Asn Asn Pro Met Val Lys Lys Ala Leu Glu Lys Gln Ile Pro Val
85 90 95
Leu Thr Glu Val Glu Leu Ala Tyr Leu Val Ser Glu Ser Gln Leu Ile
100 105 110
Gly Ile Thr Gly Ser Asn Gly Lys Thr Thr Thr Thr Met Ile Ala
115 120 125
Glu Val Leu Asn Ala Gly Gly Gln Arg Gly Leu Leu Ala Gly Asn Ile
130 135 140
Gly Phe Pro Ala Ser Glu Val Val Gln Ala Ala Asn Asp Lys Asp Thr
145 150 155 160
Leu Val Met Glu Leu Ser Ser Phe Gln Leu Met Gly Val Lys Glu Phe
165 170 175
Arg Pro His Ile Ala Val Ile Thr Asn Leu Met Pro Thr His Leu Asp
180 185 190
Tyr His Gly Ser Phe Glu Asp Tyr Val Ala Ala Lys Trp Asn Ile Gln
195 200 205
Asn Gln Met Ser Ser Ser Asp Phe Leu Val Leu Asn Phe Asn Gln Gly
210 215 220
Ile Ser Lys Glu Leu Ala Lys Thr Thr Lys Ala Thr Ile Val Pro Phe
225 230 235 240
Ser Thr Thr Glu Lys Val Asp Gly Ala Tyr Val Gln Asp Lys Gln Leu
245 250 255
Phe Tyr Lys Gly Glu Asn Ile Met Ser Val Asp Asp Ile Gly Val Pro
260 265 270
Gly Ser His Asn Val Glu Asn Ala Leu Ala Thr Ile Ala Val Ala Lys
275 280 285
Leu Ala Gly Ile Ser Asn Gln Val Ile Arg Glu Thr Leu Ser Asn Phe
290 295 300
Gly Gly Val Lys His Arg Leu Gln Ser Leu Gly Lys Val His Gly Ile
305 310 315 320
Ser Phe Tyr Asn Asp Ser Lys Ser Thr Asn Ile Leu Ala Thr Gln Lys
325 330 335
Ala Leu Ser Gly Phe Asp Asn Thr Lys Val Ile Leu Ile Ala Gly Gly

			340					345					350				
Leu	Asp	Arg	Gly	Asn	Glu	Phe	Asp	Glu	Leu	Ile	Pro	Asp	Ile	Thr	Gly		
		355					360					365					
Leu	Lys	His	Met	Val	Val	Leu	Gly	Glu	Ser	Ala	Ser	Arg	Val	Lys	Arg		
	370					375				380							
Ala	Ala	Gln	Lys	Ala	Gly	Val	Thr	Tyr	Ser	Asp	Ala	Leu	Asp	Val	Arg		
385				390					395						400		
Asp	Ala	Val	His	Lys	Ala	Tyr	Glu	Val	Ala	Gln	Gln	Gly	Asp	Val	Ile		
			405					410					415				
Leu	Leu	Ser	Pro	Ala	Asn	Ala	Ser	Trp	Asp	Met	Tyr	Lys	Asn	Phe	Glu		
		420					425					430					
Val	Arg	Gly	Asp	Glu	Phe	Ile	Asp	Thr	Phe	Glu	Ser	Leu	Arg	Gly	Glu		
	435						440					445					

<210> 34

<211> 334

<212> PRT

<213> Streptococcus agalactiae

<400> 34

Met	Gly	Arg	Val	Met	Lys	Thr	Ile	Thr	Thr	Phe	Glu	Asn	Lys	Lys	Val		
1				5				10					15				
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		20						25					30				
Ala	Lys	Leu	Gly	Ala	Ile	Val	Thr	Val	Asn	Asp	Gly	Lys	Pro	Phe	Asp		
	35					40						45					
Glu	Asn	Pro	Thr	Ala	Gln	Ser	Leu	Leu	Glu	Glu	Gly	Ile	Lys	Val	Val		
	50				55				60								
Cys	Gly	Ser	His	Pro	Leu	Glu	Leu	Leu	Asp	Glu	Asp	Phe	Cys	Tyr	Met		
65				70					75						80		
Ile	Lys	Asn	Pro	Gly	Ile	Pro	Tyr	Asn	Asn	Pro	Met	Val	Lys	Lys	Ala		
		85						90					95				
Leu	Glu	Lys	Gln	Ile	Pro	Val	Leu	Thr	Glu	Val	Glu	Leu	Ala	Tyr	Leu		
		100						105					110				
Val	Ser	Glu	Ser	Gln	Leu	Ile	Gly	Ile	Thr	Gly	Ser	Asn	Gly	Lys	Thr		
	115						120					125					
Thr	Thr	Thr	Thr	Met	Ile	Ala	Glu	Val	Leu	Asn	Ala	Gly	Gly	Gln	Arg		
	130					135					140						
Gly	Leu	Leu	Ala	Gly	Asn	Ile	Gly	Phe	Pro	Ala	Ser	Glu	Val	Val	Gln		
145				150					155						160		
Ala	Ala	Asn	Asp	Lys	Asp	Thr	Leu	Val	Met	Glu	Leu	Ser	Ser	Phe	Gln		
		165						170						175			
Leu	Met	Gly	Val	Lys	Glu	Phe	Arg	Pro	His	Ile	Ala	Val	Ile	Thr	Asn		
	180							185					190				
Leu	Met	Pro	Thr	His	Leu	Asp	Tyr	His	Gly	Ser	Phe	Glu	Asp	Tyr	Val		
	195					200						205					
Ala	Ala	Lys	Trp	Asn	Ile	Gln	Asn	Gln	Met	Ser	Ser	Ser	Asp	Phe	Leu		
	210					215					220						
Val	Leu	Asn	Phe	Asn	Gln	Gly	Ile	Ser	Lys	Glu	Leu	Ala	Lys	Thr	Thr		
225				230						235					240		
Lys	Ala	Thr	Ile	Val	Pro	Phe	Ser	Thr	Thr	Glu	Lys	Val	Asp	Gly	Ala		
		245						250						255			
Tyr	Val	Gln	Asp	Lys	Gln	Leu	Phe	Tyr	Lys	Gly	Glu	Asn	Ile	Met	Ser		
	260							265				270					
Val	Asp	Asp	Ile	Gly	Val	Pro	Gly	Ser	His	Asn	Val	Glu	Asn	Ala	Leu		

<210> 36
 <211> 1376
 <212> DNA
 <213> Streptococcus agalactiae

<400> 36
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 gttcaagcac aagaaacaga tacgacgtgg acagcacgta ctgtttcaga ggtaaaggct 120
 gatttggtaa agcaagacaa taaatcatca tatactgtga aatatgggtga tacactaagc 180
 gttatttcag aagcaatgtc aattgatatg aatgtcttag caaaaataaa taacattgca 240
 gatatcaatc ttatttatcc tgagacaaca ctgacagtaa cttacgatca gaagagtcac 300
 actgccactt caatgaaaat agaaacacca gcaacaaatg ctgctgggtca aacaacagct 360
 actgtggatt tgaaaaccaa tcaagtttct gttgcagacc aaaaagtttc tctcaataca 420
 atttcggaag gtatgacacc agaagcagca acaacgattg tttcgccaat gaagacatat 480
 tcttctgcgc cagctttgaa atcaaaagaa gtattagcac aagagcaagc tgttagtcaa 540
 gcagcagcta atgaacaggt atcaccagct cctgtgaagt cgattacttc agaagttcca 600
 gcagctaaag aggaagttaa accaactcag acgtcagtc gtcagtcaac aacagtatca 660
 ccagcttctg ttgccgctga aacaccagct ccagtagcta aagtagcacc ggtaagaact 720
 gtagcagccc ctagagtggc aagtgttaaa gtagtcactc cttaaagtaga aactgggtgca 780
 tcaccagagc atgtatcagc tccagcagtt cctgtgacta cgacttcacc agctacagac 840
 agtaagttac aagcgactga agttaagagc gttccggtag cacaaaaagc tccaacagca 900
 acaccggtag cacaaccagc ttcaacaaca aatgcagtag ctgcacatcc tgaaaatgca 960
 gggctccaac ctcatgttgc agcttataaa gaaaaagtag cgtcaactta tggagttaat 1020
 gaattcagta cataccgtgc gggagatcca ggtgatcatg gtaaaggttt agcagttgac 1080

 tttattgtag gtactaatca agcacttggt aataaagttg cacagtactc tacacaaaat 1140
 atggcagcaa ataacatttc atatgttatc tggcaacaaa agttttactc aaatacaaac 1200
 agtatttatg gacctgctaa tacttggaaat gcaatgccag atcgtgggtg cgttactgcc 1260
 aaccactatg accacgttca cgtatcatth aacaaataat ataaaaaagg aagctatttg 1320
 gcttcttttt tatatgcctt gaatagactt tcaaggttct tatataattt ttatta 1376

<210> 37
 <211> 432
 <212> PRT
 <213> Streptococcus agalactiae

<400> 37
 Met Asn Lys Lys Val Leu Leu Thr Ser Thr Met Ala Ala Ser Leu Leu
 1 5 10 15
 Ser Val Ala Ser Val Gln Ala Gln Glu Thr Asp Thr Thr Trp Thr Ala
 20 25 30
 Arg Thr Val Ser Glu Val Lys Ala Asp Leu Val Lys Gln Asp Asn Lys
 35 40 45
 Ser Ser Tyr Thr Val Lys Tyr Gly Asp Thr Leu Ser Val Ile Ser Glu
 50 55 60
 Ala Met Ser Ile Asp Met Asn Val Leu Ala Lys Ile Asn Asn Ile Ala
 65 70 75 80
 Asp Ile Asn Leu Ile Tyr Pro Glu Thr Thr Leu Thr Val Thr Tyr Asp
 85 90 95
 Gln Lys Ser His Thr Ala Thr Ser Met Lys Ile Glu Thr Pro Ala Thr
 100 105 110
 Asn Ala Ala Gly Gln Thr Thr Ala Thr Val Asp Leu Lys Thr Asn Gln
 115 120 125

Val	Ser	Val	Ala	Asp	Gln	Lys	Val	Ser	Leu	Asn	Thr	Ile	Ser	Glu	Gly
130						135					140				
Met	Thr	Pro	Glu	Ala	Ala	Thr	Thr	Ile	Val	Ser	Pro	Met	Lys	Thr	Tyr
145					150					155					160
Ser	Ser	Ala	Pro	Ala	Leu	Lys	Ser	Lys	Glu	Val	Leu	Ala	Gln	Glu	Gln
				165					170					175	
Ala	Val	Ser	Gln	Ala	Ala	Ala	Asn	Glu	Gln	Val	Ser	Pro	Ala	Pro	Val
			180					185				190			
Lys	Ser	Ile	Thr	Ser	Glu	Val	Pro	Ala	Ala	Lys	Glu	Glu	Val	Lys	Pro
	195					200					205				
Thr	Gln	Thr	Ser	Val	Ser	Gln	Ser	Thr	Thr	Val	Ser	Pro	Ala	Ser	Val
	210					215					220				
Ala	Ala	Glu	Thr	Pro	Ala	Pro	Val	Ala	Lys	Val	Ala	Pro	Val	Arg	Thr
225					230					235					240
Val	Ala	Ala	Pro	Arg	Val	Ala	Ser	Val	Lys	Val	Val	Thr	Pro	Lys	Val
				245					250					255	
Glu	Thr	Gly	Ala	Ser	Pro	Glu	His	Val	Ser	Ala	Pro	Ala	Val	Pro	Val
			260					265					270		
Thr	Thr	Thr	Ser	Pro	Ala	Thr	Asp	Ser	Lys	Leu	Gln	Ala	Thr	Glu	Val
		275					280					285			
Lys	Ser	Val	Pro	Val	Ala	Gln	Lys	Ala	Pro	Thr	Ala	Thr	Pro	Val	Ala
	290					295				300					
Gln	Pro	Ala	Ser	Thr	Thr	Asn	Ala	Val	Ala	Ala	His	Pro	Glu	Asn	Ala
305					310					315					320
Gly	Leu	Gln	Pro	His	Val	Ala	Ala	Tyr	Lys	Glu	Lys	Val	Ala	Ser	Thr
				325					330					335	
Tyr	Gly	Val	Asn	Glu	Phe	Ser	Thr	Tyr	Arg	Ala	Gly	Asp	Pro	Gly	Asp
		340						345				350			
His	Gly	Lys	Gly	Leu	Ala	Val	Asp	Phe	Ile	Val	Gly	Thr	Asn	Gln	Ala
	355					360						365			
Leu	Gly	Asn	Lys	Val	Ala	Gln	Tyr	Ser	Thr	Gln	Asn	Met	Ala	Ala	Asn
	370					375					380				
Asn	Ile	Ser	Tyr	Val	Ile	Trp	Gln	Gln	Lys	Phe	Tyr	Ser	Asn	Thr	Asn
385					390					395					400
Ser	Ile	Tyr	Gly	Pro	Ala	Asn	Thr	Trp	Asn	Ala	Met	Pro	Asp	Arg	Gly
				405					410					415	
Gly	Val	Thr	Ala	Asn	His	Tyr	Asp	His	Val	His	Val	Ser	Phe	Asn	Lys
			420					425					430		

<210> 38

<211> 392

<212> PRT

<213> Streptococcus agalactiae

<400> 38

Asp	Leu	Val	Lys	Gln	Asp	Asn	Lys	Ser	Ser	Tyr	Thr	Val	Lys	Tyr	Gly
1				5					10					15	
Asp	Thr	Leu	Ser	Val	Ile	Ser	Glu	Ala	Met	Ser	Ile	Asp	Met	Asn	Val
			20					25				30			
Leu	Ala	Lys	Ile	Asn	Asn	Ile	Ala	Asp	Ile	Asn	Leu	Ile	Tyr	Pro	Glu
		35					40					45			
Thr	Thr	Leu	Thr	Val	Thr	Tyr	Asp	Gln	Lys	Ser	His	Thr	Ala	Thr	Ser
	50					55					60				
Met	Lys	Ile	Glu	Thr	Pro	Ala	Thr	Asn	Ala	Ala	Gly	Gln	Thr	Thr	Ala
65					70					75					80

Thr	Val	Asp	Leu	Lys	Thr	Asn	Gln	Val	Ser	Val	Ala	Asp	Gln	Lys	Val	
				85					90					95		
Ser	Leu	Asn	Thr	Ile	Ser	Glu	Gly	Met	Thr	Pro	Glu	Ala	Ala	Thr	Thr	
			100					105					110			
Ile	Val	Ser	Pro	Met	Lys	Thr	Tyr	Ser	Ser	Ala	Pro	Ala	Leu	Lys	Ser	
		115					120					125				
Lys	Glu	Val	Leu	Ala	Gln	Glu	Gln	Ala	Val	Ser	Gln	Ala	Ala	Ala	Asn	
	130					135					140					
Glu	Gln	Val	Ser	Pro	Ala	Pro	Val	Lys	Ser	Ile	Thr	Ser	Glu	Val	Pro	
145					150					155					160	
Ala	Ala	Lys	Glu	Glu	Val	Lys	Pro	Thr	Gln	Thr	Ser	Val	Ser	Gln	Ser	
				165					170					175		
Thr	Thr	Val	Ser	Pro	Ala	Ser	Val	Ala	Ala	Glu	Thr	Pro	Ala	Pro	Val	
			180					185					190			
Ala	Lys	Val	Ala	Pro	Val	Arg	Thr	Val	Ala	Ala	Pro	Arg	Val	Ala	Ser	
	195						200					205				
Val	Lys	Val	Val	Thr	Pro	Lys	Val	Glu	Thr	Gly	Ala	Ser	Pro	Glu	His	
	210					215					220					
Val	Ser	Ala	Pro	Ala	Val	Pro	Val	Thr	Thr	Thr	Ser	Pro	Ala	Thr	Asp	
225					230					235					240	
Ser	Lys	Leu	Gln	Ala	Thr	Glu	Val	Lys	Ser	Val	Pro	Val	Ala	Gln	Lys	
				245					250					255		
Ala	Pro	Thr	Ala	Thr	Pro	Val	Ala	Gln	Pro	Ala	Ser	Thr	Thr	Asn	Ala	
			260					265					270			
Val	Ala	Ala	His	Pro	Glu	Asn	Ala	Gly	Leu	Gln	Pro	His	Val	Ala	Ala	
	275					280					285					
Tyr	Lys	Glu	Lys	Val	Ala	Ser	Thr	Tyr	Gly	Val	Asn	Glu	Phe	Ser	Thr	
	290					295					300					
Tyr	Arg	Ala	Gly	Asp	Pro	Gly	Asp	His	Gly	Lys	Gly	Leu	Ala	Val	Asp	
305					310					315					320	
Phe	Ile	Val	Gly	Thr	Asn	Gln	Ala	Leu	Gly	Asn	Lys	Val	Ala	Gln	Tyr	
				325					330					335		
Ser	Thr	Gln	Asn	Met	Ala	Ala	Asn	Asn	Ile	Ser	Tyr	Val	Ile	Trp	Gln	
			340					345					350			
Gln	Lys	Phe	Tyr	Ser	Asn	Thr	Asn	Ser	Ile	Tyr	Gly	Pro	Ala	Asn	Thr	
		355					360					365				
Trp	Asn	Ala	Met	Pro	Asp	Arg	Gly	Gly	Val	Thr	Ala	Asn	His	Tyr	Asp	
	370					375					380					
His	Val	His	Val	Ser	Phe	Asn	Lys									
385						390										

<210> 39

<211> 1500

<212> DNA

<213> Streptococcus agalactiae

<400> 39

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aaaattgctc	aattgattaa	agaagggtgct	aacgttttcc	gtttcaactt	ctcacatgga	180
gatcatgctg	agcaaggagc	tcgtatggct	actgttcgta	aagcagaaga	gattgcagga	240
caaaaagttg	gcttcctcct	tgatactaaa	ggacctgaaa	ttcgtacaga	actttttgaa	300
gatggtgcag	atttccattc	atatacaaca	ggtacaaaat	tacgtgttgc	tactaagcaa	360
ggtatcaaat	caactccaga	agtgattgca	ttgaatgttg	ctggtggact	tgacatcttt	420
gatgacgttg	aagttggtaa	gcaaatcctt	gttgatgatg	gtaaactagg	tcttactgtg	480


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tttgcaaaag ataaagacac tcgtgaatth gaagtagttg ttgagaatga tggccttatt 540
ggtaaacaaa aaggtgtaaa catcccttat actaaaattc ctttcccagc acttgcagaa 600
cgcgataatg ctgatatccg ttttggactt gagcaaggac ttaactttat tgctatctca 660
tttgtacgta ctgctaaaga tggtaatgaa gttcgtgcta tttgtgaaga aactggsmat 720
ggacacgtta agttgtttgc taaaattgaa aatcaacaag gtatcgataa tattgatgag 780
attatcgaa gacagatgg tattatgatt gctcgtgggtg atatgggtat cgaagttcca 840
tttgaaatgg ttccagttta ccaaaaaatg atcattacta aagttaatgc agctggtaaa 900
gcagttatta cagcaacaaa tatgcttgaa acaatgactg ataaaccacg tgcgactcgt 960
tcagaagtat ctgatgtctt caatgctgtt attgatggta ctgatgctac aatgctttca 1020
ggtgagtcag ctaatggtaa ataccagtt gagtcagttc gtacaatggc tactattgat 1080
aaaaatgctc aaacattact caatgagtat ggtcgttag actcatctgc attcccacgt 1140
aataacaaaa ctgatgttat tgcactctgc gttaaagatg caacacactc aatggatatc 1200
aaacttggtg taacaattac tgaacagggt aatacagctc gtgccatttc taaattccgt 1260
ccagatgcag acattttggc tgttacatth gatgaaaaag tacaacgttc attgatgatt 1320
aactggggtg ttatccctgt ccttgcagac aaaccagcat ctacagatga tatgtttgag 1380
gttgcagaac gtgtagcact tgaagcagga tttgttgaat caggcgataa tatcgttatc 1440
gttgcagggtg ttctgttagg tacagggtga actaacacaa tgcgtgttcg tactgttaaa 1500

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<210> 40
<211> 500
<212> PRT
<213> Streptococcus agalactiae

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<220>
<221> VARIANT
<222> (1)...(500)
<223> Xaa = Any Amino Acid

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<400> 40
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Phe Arg Gly Gly Lys Lys Phe Gly Glu Ser Gly Tyr Trp Gly Glu Ser
20          25          30
Leu Asp Val Glu Ala Ser Ala Glu Lys Ile Ala Gln Leu Ile Lys Glu
35          40          45
Gly Ala Asn Val Phe Arg Phe Asn Phe Ser His Gly Asp His Ala Glu
50          55          60
Gln Gly Ala Arg Met Ala Thr Val Arg Lys Ala Glu Glu Ile Ala Gly
65          70          75          80
Gln Lys Val Gly Phe Leu Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr
85          90          95
Glu Leu Phe Glu Asp Gly Ala Asp Phe His Ser Tyr Thr Thr Gly Thr
100         105         110
Lys Leu Arg Val Ala Thr Lys Gln Gly Ile Lys Ser Thr Pro Glu Val
115         120         125
Ile Ala Leu Asn Val Ala Gly Gly Leu Asp Ile Phe Asp Asp Val Glu
130         135         140
Val Gly Lys Gln Ile Leu Val Asp Asp Gly Lys Leu Gly Leu Thr Val
145         150         155         160
Phe Ala Lys Asp Lys Asp Thr Arg Glu Phe Glu Val Val Val Glu Asn
165         170         175
Asp Gly Leu Ile Gly Lys Gln Lys Gly Val Asn Ile Pro Tyr Thr Lys
180         185         190
Ile Pro Phe Pro Ala Leu Ala Glu Arg Asp Asn Ala Asp Ile Arg Phe
195         200         205

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Gly	Leu	Glu	Gln	Gly	Leu	Asn	Phe	Ile	Ala	Ile	Ser	Phe	Val	Arg	Thr
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Ala	Lys	Asp	Val	Asn	Glu	Val	Arg	Ala	Ile	Cys	Glu	Glu	Thr	Gly	Xaa
225					230					235					240
Gly	His	Val	Lys	Leu	Phe	Ala	Lys	Ile	Glu	Asn	Gln	Gln	Gly	Ile	Asp
				245					250					255	
Asn	Ile	Asp	Glu	Ile	Ile	Glu	Ala	Ala	Asp	Gly	Ile	Met	Ile	Ala	Arg
			260					265					270		
Gly	Asp	Met	Gly	Ile	Glu	Val	Pro	Phe	Glu	Met	Val	Pro	Val	Tyr	Gln
	275						280					285			
Lys	Met	Ile	Ile	Thr	Lys	Val	Asn	Ala	Ala	Gly	Lys	Ala	Val	Ile	Thr
290						295					300				
Ala	Thr	Asn	Met	Leu	Glu	Thr	Met	Thr	Asp	Lys	Pro	Arg	Ala	Thr	Arg
305					310					315					320
Ser	Glu	Val	Ser	Asp	Val	Phe	Asn	Ala	Val	Ile	Asp	Gly	Thr	Asp	Ala
				325					330					335	
Thr	Met	Leu	Ser	Gly	Glu	Ser	Ala	Asn	Gly	Lys	Tyr	Pro	Val	Glu	Ser
			340					345					350		
Val	Arg	Thr	Met	Ala	Thr	Ile	Asp	Lys	Asn	Ala	Gln	Thr	Leu	Leu	Asn
	355						360					365			
Glu	Tyr	Gly	Arg	Leu	Asp	Ser	Ser	Ala	Phe	Pro	Arg	Asn	Asn	Lys	Thr
370						375					380				
Asp	Val	Ile	Ala	Ser	Ala	Val	Lys	Asp	Ala	Thr	His	Ser	Met	Asp	Ile
385					390					395					400
Lys	Leu	Val	Val	Thr	Ile	Thr	Glu	Thr	Gly	Asn	Thr	Ala	Arg	Ala	Ile
				405					410					415	
Ser	Lys	Phe	Arg	Pro	Asp	Ala	Asp	Ile	Leu	Ala	Val	Thr	Phe	Asp	Glu
			420					425					430		
Lys	Val	Gln	Arg	Ser	Leu	Met	Ile	Asn	Trp	Gly	Val	Ile	Pro	Val	Leu
	435						440					445			
Ala	Asp	Lys	Pro	Ala	Ser	Thr	Asp	Asp	Met	Phe	Glu	Val	Ala	Glu	Arg
	450					455					460				
Val	Ala	Leu	Glu	Ala	Gly	Phe	Val	Glu	Ser	Gly	Asp	Asn	Ile	Val	Ile
465					470					475					480
Val	Ala	Gly	Val	Pro	Val	Gly	Thr	Gly	Gly	Thr	Asn	Thr	Met	Arg	Val
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Arg	Thr	Val	Lys												
			500												

<210> 41
 <211> 720
 <212> DNA
 <213> Streptococcus agalactiae

<400> 41	
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atgaccgaac tatctgatgt atatggtgaa gagctgattt ctccattcac tattacagct	180
ggtgatgaat ttcaagcttt attgaaacca tcaaaaaagg tatttcaaatt tattgaccat	240
attcaactag ctctaaaacc tgttaatgta aggttcggcc tcggtacagg aaacattata	300
acatccatca attcaaatga aagtatcggt gctgatggtc ctgcctactg gcatgctcgc	360
tcagctatta atcatataca tgataaaaaat gattatggaa cagttcaagt agctatttgc	420
cttgatgatg aagacaaaaa ccttgaatta acactaaata gtctcatttc agctggtgat	480
tttatcaagt caaaatggac tacaaaccat tttcaaattgc ttgagcactt aataacttcaa	540
gataattatc aagaacaatt tcaacatcaa aagttagccc aactggaaaa tattgaacct	600

agtgcgctga ctaaacgcct taaagcaagc ggtctgaaga ttactttaag aacgagaaca 660
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<210> 42
<211> 240
<212> PRT
<213> Streptococcus agalactiae

<400> 42
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Phe Gln Gln Ser Phe Gln Gln Leu Met Thr Glu Leu Ser Asp Val Tyr
35 40 45
Gly Glu Glu Leu Ile Ser Pro Phe Thr Ile Thr Ala Gly Asp Glu Phe
50 55 60
Gln Ala Leu Leu Lys Pro Ser Lys Lys Val Phe Gln Ile Ile Asp His
65 70 75 80
Ile Gln Leu Ala Leu Lys Pro Val Asn Val Arg Phe Gly Leu Gly Thr
85 90 95
Gly Asn Ile Ile Thr Ser Ile Asn Ser Asn Glu Ser Ile Gly Ala Asp
100 105 110
Gly Pro Ala Tyr Trp His Ala Arg Ser Ala Ile Asn His Ile His Asp
115 120 125
Lys Asn Asp Tyr Gly Thr Val Gln Val Ala Ile Cys Leu Asp Asp Glu
130 135 140
Asp Gln Asn Leu Glu Leu Thr Leu Asn Ser Leu Ile Ser Ala Gly Asp
145 150 155 160
Phe Ile Lys Ser Lys Trp Thr Thr Asn His Phe Gln Met Leu Glu His
165 170 175
Leu Ile Leu Gln Asp Asn Tyr Gln Glu Gln Phe Gln His Gln Lys Leu
180 185 190
Ala Gln Leu Glu Asn Ile Glu Pro Ser Ala Leu Thr Lys Arg Leu Lys
195 200 205
Ala Ser Gly Leu Lys Ile Tyr Leu Arg Thr Arg Thr Gln Ala Ala Asp
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Leu Leu Val Lys Ser Cys Thr Gln Thr Lys Gly Gly Ser Tyr Asp Phe
225 230 235 240

<210> 43
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<213> Streptococcus agalactiae

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Ser Asp Val Tyr Gly Glu Glu Leu Ile Ser Pro Phe Thr Ile Thr Ala
35 40 45
Gly Asp Glu Phe Gln Ala Leu Leu Lys Pro Ser Lys Lys Val Phe Gln
50 55 60
Ile Ile Asp His Ile Gln Leu Ala Leu Lys Pro Val Asn Val Arg Phe

65		70		75		80									
Gly	Leu	Gly	Thr	Gly	Asn	Ile	Ile	Thr	Ser	Ile	Asn	Ser	Asn	Glu	Ser
		85						90						95	
Ile	Gly	Ala	Asp	Gly	Pro	Ala	Tyr	Trp	His	Ala	Arg	Ser	Ala	Ile	Asn
		100						105					110		
His	Ile	His	Asp	Lys	Asn	Asp	Tyr	Gly	Thr	Val	Gln	Val	Ala	Ile	Cys
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Leu	Asp	Asp	Glu	Asp	Gln	Asn	Leu	Glu	Leu	Thr	Leu	Asn	Ser	Leu	Ile
	130				135						140				
Ser	Ala	Gly	Asp	Phe	Ile	Lys	Ser	Lys	Trp	Thr	Thr	Asn	His	Phe	Gln
145					150					155					160
Met	Leu	Glu	His	Leu	Ile	Leu	Gln	Asp	Asn	Tyr	Gln	Glu	Gln	Phe	Gln
			165					170						175	
His	Gln	Lys	Leu	Ala	Gln	Leu	Glu	Asn	Ile	Glu	Pro	Ser	Ala	Leu	Thr
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Lys	Arg	Leu	Lys	Ala	Ser	Gly	Leu	Lys	Ile	Tyr	Leu	Arg	Thr	Arg	Thr
	195					200					205				
Gln	Ala	Ala	Asp	Leu	Leu	Val	Lys	Ser	Cys	Thr	Gln	Thr	Lys	Gly	Gly
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Ser	Tyr	Asp	Phe												
225															

<210> 44
 <211> 2193
 <212> DNA
 <213> Streptococcus agalactiae

<400> 44

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gaatacccaa	taagaaatgc	tttaaatttt	tcgtttgctt	ttggtggaaa	taatagtggg	1140
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gaaaaagttg	ctagtaattt	caacgacttt	gaagcattac	gcttttaaagg	ggctagacca	1320
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aagcaaataca	caacagaagg	atatgcacat	gtttctgctt	cacgattccc	gtttacagta	1560
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tggtggcaac aattaaacta tgatagtcaa atgtttgtcg gttctgatta ttgttcagca 1800
caagtcctct ctcgtcaagc attggataat tctcctataa tattaggtag taaacaatta 1860
aaatatagcc ataaaacatt cacagatgtg atgactatgt ttgatgctgc gcttcaaaat 1920
ttattatcag acttaggact aaccataaaa gatatcaaag gtttcgtttg gaatgagcgg 1980
aagaaggcag ttagttcaga ttatgatttc ttagcgaaact tgtctgagta ttataatatg 2040
ccaaaccttg cttctgggtca gtttggtattt tcactctaatt gtgctggtga agaactggac 2100
tatactgtta atgaaagtat agaaaagggc tattatttag tcctatctta ttcgatcttc 2160
ggtggtatct cttttgctat tattgaaaaa agg 2193

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<210> 45

<211> 731

<212> PRT

<213> Streptococcus agalactiae

<400> 45

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Ser Lys His Leu Tyr Lys Asn His Asp Ser Ile Leu Glu Ser Tyr Thr
      35           40           45
Gly Ser Ile Thr Ser Asp Pro Glu Val Pro Glu Gln Tyr Lys Asp Glu
      50           55           60
Thr Arg Asn Phe Lys Phe Ala Phe Thr Ala Phe Glu Glu Ala Leu Ala
      65           70           75           80
Ser Ser Gly Val Asn Leu Lys Ala Tyr His Asn Ile Ala Val Cys Leu
      85           90           95
Gly Thr Ser Leu Gly Gly Lys Ser Ala Gly Gln Asn Ala Leu Tyr Gln
      100          105          110
Phe Glu Glu Gly Glu Arg Gln Val Asp Ala Ser Leu Leu Glu Lys Ala
      115          120          125
Ser Val Tyr His Ile Ala Asp Glu Leu Met Ala Tyr His Asp Ile Val
      130          135          140
Gly Ala Ser Tyr Val Ile Ser Thr Ala Cys Ser Ala Ser Asn Asn Ala
      145          150          155          160
Val Ile Leu Gly Thr Gln Leu Leu Gln Asp Gly Asp Cys Asp Leu Ala
      165          170          175
Ile Cys Gly Gly Cys Asp Glu Leu Ser Asp Ile Ser Leu Ala Gly Phe
      180          185          190
Thr Ser Leu Gly Ala Ile Asn Thr Glu Met Ala Cys Gln Pro Tyr Ser
      195          200          205
Ser Gly Lys Gly Ile Asn Leu Gly Glu Gly Ala Gly Phe Val Val Leu
      210          215          220
Val Lys Asp Gln Ser Leu Ala Lys Tyr Gly Lys Ile Ile Gly Gly Leu
      225          230          235          240
Ile Thr Ser Asp Gly Tyr His Ile Thr Ala Pro Lys Pro Thr Gly Glu
      245          250          255
Gly Ala Ala Gln Ile Ala Lys Gln Leu Val Thr Gln Ala Gly Ile Asp
      260          265          270
Tyr Ser Glu Ile Asp Tyr Ile Asn Gly His Gly Thr Gly Thr Gln Ala
      275          280          285
Asn Asp Lys Met Glu Lys Asn Met Tyr Gly Lys Phe Phe Pro Thr Thr
      290          295          300

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Thr	Leu	Ile	Ser	Ser	Thr	Lys	Gly	Gln	Thr	Gly	His	Thr	Leu	Gly	Ala
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Ala	Gly	Ile	Ile	Glu	Leu	Ile	Asn	Cys	Leu	Ala	Ala	Ile	Glu	Glu	Gln
				325					330						335
Thr	Val	Pro	Ala	Thr	Lys	Asn	Glu	Ile	Gly	Ile	Glu	Gly	Phe	Pro	Glu
			340					345					350		
Asn	Phe	Val	Tyr	His	Gln	Lys	Arg	Glu	Tyr	Pro	Ile	Arg	Asn	Ala	Leu
		355					360					365			
Asn	Phe	Ser	Phe	Ala	Phe	Gly	Gly	Asn	Asn	Ser	Gly	Val	Leu	Leu	Ser
	370					375					380				
Ser	Leu	Asp	Ser	Pro	Leu	Glu	Thr	Leu	Pro	Ala	Arg	Glu	Asn	Leu	Lys
385					390					395					400
Met	Ala	Ile	Leu	Ser	Ser	Val	Ala	Ser	Ile	Ser	Lys	Asn	Glu	Ser	Leu
				405					410						415
Ser	Ile	Thr	Tyr	Glu	Lys	Val	Ala	Ser	Asn	Phe	Asn	Asp	Phe	Glu	Ala
			420					425					430		
Leu	Arg	Phe	Lys	Gly	Ala	Arg	Pro	Pro	Lys	Thr	Val	Asn	Pro	Ala	Gln
		435					440					445			
Phe	Arg	Lys	Met	Asp	Asp	Phe	Ser	Lys	Met	Val	Ala	Val	Thr	Thr	Ala
	450					455					460				
Gln	Ala	Leu	Ile	Glu	Ser	Asn	Ile	Asn	Leu	Lys	Lys	Gln	Asp	Thr	Ser
465					470					475					480
Lys	Val	Gly	Ile	Val	Phe	Thr	Thr	Leu	Ser	Gly	Pro	Val	Glu	Val	Val
				485					490						495
Glu	Gly	Ile	Glu	Lys	Gln	Ile	Thr	Thr	Glu	Gly	Tyr	Ala	His	Val	Ser
			500					505					510		
Ala	Ser	Arg	Phe	Pro	Phe	Thr	Val	Met	Asn	Ala	Ala	Ala	Gly	Met	Leu
		515					520					525			
Ser	Ile	Ile	Phe	Lys	Ile	Thr	Gly	Pro	Leu	Ser	Val	Ile	Ser	Thr	Asn
	530					535					540				
Ser	Gly	Ala	Leu	Asp	Gly	Ile	Gln	Tyr	Ala	Lys	Glu	Met	Met	Arg	Asn
545					550					555					560
Asp	Asn	Leu	Asp	Tyr	Val	Ile	Leu	Val	Ser	Ala	Asn	Gln	Trp	Thr	Asp
			565						570					575	
Met	Ser	Phe	Met	Trp	Trp	Gln	Gln	Leu	Asn	Tyr	Asp	Ser	Gln	Met	Phe
			580					585					590		
Val	Gly	Ser	Asp	Tyr	Cys	Ser	Ala	Gln	Val	Leu	Ser	Arg	Gln	Ala	Leu
		595					600					605			
Asp	Asn	Ser	Pro	Ile	Ile	Leu	Gly	Ser	Lys	Gln	Leu	Lys	Tyr	Ser	His
	610					615					620				
Lys	Thr	Phe	Thr	Asp	Val	Met	Thr	Ile	Phe	Asp	Ala	Ala	Leu	Gln	Asn
625					630					635					640
Leu	Leu	Ser	Asp	Leu	Gly	Leu	Thr	Ile	Lys	Asp	Ile	Lys	Gly	Phe	Val
				645					650					655	
Trp	Asn	Glu	Arg	Lys	Lys	Ala	Val	Ser	Ser	Asp	Tyr	Asp	Phe	Leu	Ala
			660					665					670		
Asn	Leu	Ser	Glu	Tyr	Tyr	Asn	Met	Pro	Asn	Leu	Ala	Ser	Gly	Gln	Phe
		675					680					685			
Gly	Phe	Ser	Ser	Asn	Gly	Ala	Gly	Glu	Glu	Leu	Asp	Tyr	Thr	Val	Asn
	690					695					700				
Glu	Ser	Ile	Glu	Lys	Gly	Tyr	Tyr	Leu	Val	Leu	Ser	Tyr	Ser	Ile	Phe
705					710					715					720
Gly	Gly	Ile	Ser	Phe	Ala	Ile	Ile	Glu	Lys	Arg					

725

730

<210> 46
 <211> 727
 <212> PRT
 <213> Streptococcus agalactiae

<400> 46
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 35 40 45
 Ser Asp Pro Glu Val Pro Glu Gln Tyr Lys Asp Glu Thr Arg Asn Phe
 50 55 60
 Lys Phe Ala Phe Thr Ala Phe Glu Glu Ala Leu Ala Ser Ser Gly Val
 65 70 75 80
 Asn Leu Lys Ala Tyr His Asn Ile Ala Val Cys Leu Gly Thr Ser Leu
 85 90 95
 Gly Gly Lys Ser Ala Gly Gln Asn Ala Leu Tyr Gln Phe Glu Glu Gly
 100 105 110
 Glu Arg Gln Val Asp Ala Ser Leu Leu Glu Lys Ala Ser Val Tyr His
 115 120 125
 Ile Ala Asp Glu Leu Met Ala Tyr His Asp Ile Val Gly Ala Ser Tyr
 130 135 140
 Val Ile Ser Thr Ala Cys Ser Ala Ser Asn Asn Ala Val Ile Leu Gly
 145 150 155 160
 Thr Gln Leu Leu Gln Asp Gly Asp Cys Asp Leu Ala Ile Cys Gly Gly
 165 170 175
 Cys Asp Glu Leu Ser Asp Ile Ser Leu Ala Gly Phe Thr Ser Leu Gly
 180 185 190
 Ala Ile Asn Thr Glu Met Ala Cys Gln Pro Tyr Ser Ser Gly Lys Gly
 195 200 205
 Ile Asn Leu Gly Glu Gly Ala Gly Phe Val Val Leu Val Lys Asp Gln
 210 215 220
 Ser Leu Ala Lys Tyr Gly Lys Ile Ile Gly Gly Leu Ile Thr Ser Asp
 225 230 235 240
 Gly Tyr His Ile Thr Ala Pro Lys Pro Thr Gly Glu Gly Ala Ala Gln
 245 250 255
 Ile Ala Lys Gln Leu Val Thr Gln Ala Gly Ile Asp Tyr Ser Glu Ile
 260 265 270
 Asp Tyr Ile Asn Gly His Gly Thr Gly Thr Gln Ala Asn Asp Lys Met
 275 280 285
 Glu Lys Asn Met Tyr Gly Lys Phe Phe Pro Thr Thr Thr Leu Ile Ser
 290 295 300
 Ser Thr Lys Gly Gln Thr Gly His Thr Leu Gly Ala Ala Gly Ile Ile
 305 310 315 320
 Glu Leu Ile Asn Cys Leu Ala Ala Ile Glu Glu Gln Thr Val Pro Ala
 325 330 335
 Thr Lys Asn Glu Ile Gly Ile Glu Gly Phe Pro Glu Asn Phe Val Tyr
 340 345 350
 His Gln Lys Arg Glu Tyr Pro Ile Arg Asn Ala Leu Asn Phe Ser Phe
 355 360 365
 Ala Phe Gly Gly Asn Asn Ser Gly Val Leu Leu Ser Ser Leu Asp Ser
 370 375 380

Pro Leu Glu Thr Leu Pro Ala Arg Glu Asn Leu Lys Met Ala Ile Leu
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 405 410 415
 Glu Lys Val Ala Ser Asn Phe Asn Asp Phe Glu Ala Leu Arg Phe Lys
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 435 440 445
 Asp Asp Phe Ser Lys Met Val Ala Val Thr Thr Ala Gln Ala Leu Ile
 450 455 460
 Glu Ser Asn Ile Asn Leu Lys Lys Gln Asp Thr Ser Lys Val Gly Ile
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 Val Phe Thr Thr Leu Ser Gly Pro Val Glu Val Val Glu Gly Ile Glu
 485 490 495
 Lys Gln Ile Thr Thr Glu Gly Tyr Ala His Val Ser Ala Ser Arg Phe
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 Pro Phe Thr Val Met Asn Ala Ala Ala Gly Met Leu Ser Ile Ile Phe
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 545 550 555 560
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 Tyr Cys Ser Ala Gln Val Leu Ser Arg Gln Ala Leu Asp Asn Ser Pro
 595 600 605
 Ile Ile Leu Gly Ser Lys Gln Leu Lys Tyr Ser His Lys Thr Phe Thr
 610 615 620
 Asp Val Met Thr Ile Phe Asp Ala Ala Leu Gln Asn Leu Leu Ser Asp
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 645 650 655
 Lys Lys Ala Val Ser Ser Asp Tyr Asp Phe Leu Ala Asn Leu Ser Glu
 660 665 670
 Tyr Tyr Asn Met Pro Asn Leu Ala Ser Gly Gln Phe Gly Phe Ser Ser
 675 680 685
 Asn Gly Ala Gly Glu Glu Leu Asp Tyr Thr Val Asn Glu Ser Ile Glu
 690 695 700
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 705 710 715 720
 Phe Ala Ile Ile Glu Lys Arg

725

<210> 47
 <211> 900
 <212> DNA
 <213> Streptococcus agalactiae

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 agttggaaaa ccaagcttgt ggttttaatc atcttactgc tacttggcgg aggggggacta 180

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ggaaaattag	tgctgatag	ctttacccat	ggaacagctg	aacaacgcca	acgttggttt	840
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<210> 48

<211> 300

<212> PRT

<213> Streptococcus agalactiae

<400> 48

Met	Lys	Ile	Asp	Asp	Leu	Arg	Lys	Ser	Asp	Asn	Val	Glu	Asp	Arg	Arg
1				5					10					15	
Ser	Ser	Ser	Gly	Gly	Ser	Phe	Ser	Ser	Gly	Gly	Ser	Gly	Leu	Pro	Ile
			20					25					30		
Leu	Gln	Leu	Leu	Leu	Leu	Arg	Gly	Ser	Trp	Lys	Thr	Lys	Leu	Val	Val
		35					40					45			
Leu	Ile	Ile	Leu	Leu	Leu	Leu	Gly	Gly	Gly	Gly	Leu	Thr	Ser	Ile	Phe
	50					55					60				
Asn	Asp	Ser	Ser	Ser	Pro	Ser	Ser	Tyr	Gln	Ser	Gln	Asn	Val	Ser	Arg
65					70				75					80	
Ser	Val	Asp	Asn	Ser	Ala	Thr	Arg	Glu	Gln	Ile	Asp	Phe	Val	Asn	Lys
			85					90						95	
Val	Leu	Gly	Ser	Thr	Glu	Asp	Phe	Trp	Ser	Gln	Glu	Phe	Gln	Thr	Gln
			100					105						110	
Gly	Phe	Gly	Asn	Tyr	Lys	Glu	Pro	Lys	Leu	Val	Leu	Tyr	Thr	Asn	Ser
		115					120					125			
Ile	Gln	Thr	Gly	Cys	Gly	Ile	Gly	Glu	Ser	Ala	Ser	Gly	Pro	Phe	Tyr
	130					135						140			
Cys	Ser	Ala	Asp	Lys	Lys	Ile	Tyr	Leu	Asp	Ile	Ser	Phe	Tyr	Asn	Glu
145				150					155					160	
Leu	Ser	His	Lys	Tyr	Gly	Ala	Thr	Gly	Asp	Phe	Ala	Met	Ala	Tyr	Val
			165					170						175	
Ile	Ala	His	Glu	Val	Gly	His	His	Ile	Gln	Thr	Glu	Leu	Gly	Ile	Met
		180						185					190		
Asp	Lys	Tyr	Asn	Arg	Met	Arg	His	Gly	Leu	Thr	Lys	Lys	Glu	Ala	Asn
	195					200						205			
Ala	Leu	Asn	Val	Arg	Leu	Glu	Leu	Gln	Ala	Asp	Tyr	Tyr	Ala	Gly	Val
	210				215						220				
Trp	Ala	His	Tyr	Ile	Arg	Gly	Lys	Asn	Leu	Leu	Gln	Gly	Asp	Phe	
225				230				235						240	
Glu	Glu	Ala	Met	Asn	Ala	Ala	His	Ala	Val	Gly	Asp	Asp	Thr	Leu	Gln
			245					250						255	
Lys	Glu	Thr	Tyr	Gly	Lys	Leu	Val	Pro	Asp	Ser	Phe	Thr	His	Gly	Thr
		260					265						270		
Ala	Glu	Gln	Arg	Gln	Arg	Trp	Phe	Asn	Lys	Gly	Phe	Gln	Tyr	Gly	Asp
	275					280						285			

Ile Gln His Gly Asp Thr Phe Ser Val Glu His Leu
 290 295 300

<210> 49
 <211> 1242
 <212> DNA
 <213> Streptococcus agalactiae

<400> 49
 atgagtaaac gacaaaattt aggaattagt aaaaaaggag caattatatc agggctctca 60
 gtggcactaa ttgtagtaat aggtggcttt ttatgggtac aatctcaacc taataagagt 120
 gcagtaaaaa ctaactacaa agtttttaat gttagagaag gaagtgtttc gtcctcaact 180
 cttttgacag gaaaagctaa ggctaataca gaacagtatg tgtattttga tgctaataaa 240
 ggtaatcgag caactgtcac agttaaagtg ggtgataaaa tcacagctgg tcagcagtta 300
 gttcaatatg atacaacaac tgcacaagca gcctacgaca ctgctaatacg tcaattaaat 360
 aaagtagcgc gtcagattaa taatctaaag acaacaggaa gtcttccagc tatggaatca 420
 agtgatcaat cttcttcac atcacaagga caagggactc aatcgactag tgggtgcgacg 480
 aatcgtctac agcaaaatta tcaaagtcaa gctaattgctt catacaacca acaacttcaa 540
 gatttgaatg atgcttatgc agatgcacag gcagaagtaa ataaagcaca aaaagcattg 600
 aatgatactg ttattacaag tgacgtatca gggacagttg ttgaagttaa tagtgatatt 660
 gatccagctt caaaaactag tcaagtactt gtccatgtag caactgaagg taaactccaa 720
 gtacaaggaa cgatgagtga gtatgatttg gctaattgta aaaaagacca ggctgttaaa 780
 ataaaatcta aggtctatcc tgacaaggaa tgggaaggta aaatttcata tatctcaaat 840
 tatccagaag cagaagcaaa caacaatgac tctaataacg gctctagtgc tgtaaattat 900
 aaatataaag tagatattac tagccctctc gatgcattaa aacaagggtt taccgtatca 960
 gttgaagtag ttaatggaga taagcacctt attgtcccta caagttctgt gataaacaaa 1020
 gataataaac actttgtttg ggtatacaat gattctaate gtaaaatttc caaagttgaa 1080
 gtcaaaattg gtaaagctga tgctaagaca caagaaattt tatcagggtt gaaagcagga 1140
 caaatcgtgg ttactaatcc aagtaaaacc ttcaaggatg ggcaaaaaat tgataatatt 1200
 gaatcaatcg atcttaactc taataagaaa tcagaggtga aa 1242

<210> 50
 <211> 414
 <212> PRT
 <213> Streptococcus agalactiae

<400> 50
 Met Ser Lys Arg Gln Asn Leu Gly Ile Ser Lys Lys Gly Ala Ile Ile
 1 5 10 15
 Ser Gly Leu Ser Val Ala Leu Ile Val Val Ile Gly Gly Phe Leu Trp
 20 25 30
 Val Gln Ser Gln Pro Asn Lys Ser Ala Val Lys Thr Asn Tyr Lys Val
 35 40 45
 Phe Asn Val Arg Glu Gly Ser Val Ser Ser Ser Thr Leu Leu Thr Gly
 50 55 60
 Lys Ala Lys Ala Asn Gln Glu Gln Tyr Val Tyr Phe Asp Ala Asn Lys
 65 70 75 80
 Gly Asn Arg Ala Thr Val Thr Val Lys Val Gly Asp Lys Ile Thr Ala
 85 90 95
 Gly Gln Gln Leu Val Gln Tyr Asp Thr Thr Thr Ala Gln Ala Ala Tyr
 100 105 110
 Asp Thr Ala Asn Arg Gln Leu Asn Lys Val Ala Arg Gln Ile Asn Asn
 115 120 125
 Leu Lys Thr Thr Gly Ser Leu Pro Ala Met Glu Ser Ser Asp Gln Ser
 130 135 140

Ser	Ser	Ser	Ser	Gln	Gly	Gln	Gly	Thr	Gln	Ser	Thr	Ser	Gly	Ala	Thr
145					150				155						160
Asn	Arg	Leu	Gln	Gln	Asn	Tyr	Gln	Ser	Gln	Ala	Asn	Ala	Ser	Tyr	Asn
				165					170						175
Gln	Gln	Leu	Gln	Asp	Leu	Asn	Asp	Ala	Tyr	Ala	Asp	Ala	Gln	Ala	Glu
			180					185					190		
Val	Asn	Lys	Ala	Gln	Lys	Ala	Leu	Asn	Asp	Thr	Val	Ile	Thr	Ser	Asp
	195						200				205				
Val	Ser	Gly	Thr	Val	Val	Glu	Val	Asn	Ser	Asp	Ile	Asp	Pro	Ala	Ser
	210					215					220				
Lys	Thr	Ser	Gln	Val	Leu	Val	His	Val	Ala	Thr	Glu	Gly	Lys	Leu	Gln
225					230					235					240
Val	Gln	Gly	Thr	Met	Ser	Glu	Tyr	Asp	Leu	Ala	Asn	Val	Lys	Lys	Asp
				245					250						255
Gln	Ala	Val	Lys	Ile	Lys	Ser	Lys	Val	Tyr	Pro	Asp	Lys	Glu	Trp	Glu
		260						265					270		
Gly	Lys	Ile	Ser	Tyr	Ile	Ser	Asn	Tyr	Pro	Glu	Ala	Glu	Ala	Asn	Asn
		275					280					285			
Asn	Asp	Ser	Asn	Asn	Gly	Ser	Ser	Ala	Val	Asn	Tyr	Lys	Tyr	Lys	Val
	290					295				300					
Asp	Ile	Thr	Ser	Pro	Leu	Asp	Ala	Leu	Lys	Gln	Gly	Phe	Thr	Val	Ser
305					310					315					320
Val	Glu	Val	Val	Asn	Gly	Asp	Lys	His	Leu	Ile	Val	Pro	Thr	Ser	Ser
				325					330					335	
Val	Ile	Asn	Lys	Asp	Asn	Lys	His	Phe	Val	Trp	Val	Tyr	Asn	Asp	Ser
		340						345					350		
Asn	Arg	Lys	Ile	Ser	Lys	Val	Glu	Val	Lys	Ile	Gly	Lys	Ala	Asp	Ala
		355					360					365			
Lys	Thr	Gln	Glu	Ile	Leu	Ser	Gly	Leu	Lys	Ala	Gly	Gln	Ile	Val	Val
	370					375					380				
Thr	Asn	Pro	Ser	Lys	Thr	Phe	Lys	Asp	Gly	Gln	Lys	Ile	Asp	Asn	Ile
385					390					395					400
Glu	Ser	Ile	Asp	Leu	Asn	Ser	Asn	Lys	Lys	Ser	Glu	Val	Lys		
				405					410						

<210> 51
 <211> 385
 <212> PRT
 <213> Streptococcus agalactiae

<400> 51

Phe	Leu	Trp	Val	Gln	Ser	Gln	Pro	Asn	Lys	Ser	Ala	Val	Lys	Thr	Asn
1				5					10					15	
Tyr	Lys	Val	Phe	Asn	Val	Arg	Glu	Gly	Ser	Val	Ser	Ser	Ser	Thr	Leu
		20						25					30		
Leu	Thr	Gly	Lys	Ala	Lys	Ala	Asn	Gln	Glu	Gln	Tyr	Val	Tyr	Phe	Asp
		35					40					45			
Ala	Asn	Lys	Gly	Asn	Arg	Ala	Thr	Val	Thr	Val	Lys	Val	Gly	Asp	Lys
	50					55					60				
Ile	Thr	Ala	Gly	Gln	Gln	Leu	Val	Gln	Tyr	Asp	Thr	Thr	Thr	Ala	Gln
65					70					75					80
Ala	Ala	Tyr	Asp	Thr	Ala	Asn	Arg	Gln	Leu	Asn	Lys	Val	Ala	Arg	Gln
				85					90					95	
Ile	Asn	Asn	Leu	Lys	Thr	Thr	Gly	Ser	Leu	Pro	Ala	Met	Glu	Ser	Ser
			100					105					110		

Asp Gln Ser Ser Ser Ser Ser Gln Gly Gln Gly Thr Gln Ser Thr Ser
 115 120 125
 Gly Ala Thr Asn Arg Leu Gln Gln Asn Tyr Gln Ser Gln Ala Asn Ala
 130 135 140
 Ser Tyr Asn Gln Gln Leu Gln Asp Leu Asn Asp Ala Tyr Ala Asp Ala
 145 150 155 160
 Gln Ala Glu Val Asn Lys Ala Gln Lys Ala Leu Asn Asp Thr Val Ile
 165 170 175
 Thr Ser Asp Val Ser Gly Thr Val Val Glu Val Asn Ser Asp Ile Asp
 180 185 190
 Pro Ala Ser Lys Thr Ser Gln Val Leu Val His Val Ala Thr Glu Gly
 195 200 205
 Lys Leu Gln Val Gln Gly Thr Met Ser Glu Tyr Asp Leu Ala Asn Val
 210 215 220
 Lys Lys Asp Gln Ala Val Lys Ile Lys Ser Lys Val Tyr Pro Asp Lys
 225 230 235 240
 Glu Trp Glu Gly Lys Ile Ser Tyr Ile Ser Asn Tyr Pro Glu Ala Glu
 245 250 255
 Ala Asn Asn Asn Asp Ser Asn Asn Gly Ser Ser Ala Val Asn Tyr Lys
 260 265 270
 Tyr Lys Val Asp Ile Thr Ser Pro Leu Asp Ala Leu Lys Gln Gly Phe
 275 280 285
 Thr Val Ser Val Glu Val Val Asn Gly Asp Lys His Leu Ile Val Pro
 290 295 300
 Thr Ser Ser Val Ile Asn Lys Asp Asn Lys His Phe Val Trp Val Tyr
 305 310 315 320
 Asn Asp Ser Asn Arg Lys Ile Ser Lys Val Glu Val Lys Ile Gly Lys
 325 330 335
 Ala Asp Ala Lys Thr Gln Glu Ile Leu Ser Gly Leu Lys Ala Gly Gln
 340 345 350
 Ile Val Val Thr Asn Pro Ser Lys Thr Phe Lys Asp Gly Gln Lys Ile
 355 360 365
 Asp Asn Ile Glu Ser Ile Asp Leu Asn Ser Asn Lys Lys Ser Glu Val
 370 375 380
 Lys
 385

<210> 52
 <211> 930
 <212> DNA
 <213> Streptococcus agalactiae

<400> 52
 atgaaaaaaa ttggaattat tgtcctcaca ctactgacct tcttttttgggt atcttgcgga 60
 caacaaacta aacaagaaag cactaaaaca actattttcta aaatgcctaa aattgaaggc 120
 ttcacctatt atggaaaaat tcctgaaaat ccgaaaaaag taattaattt tacatattct 180
 tacactgggt atttatttaa actaggtggt aatgtttcaa gttacagttt agacttagaa 240
 aaagatagcc ccgttttttg taaacaactg aaagaagcta aaaaattaac tgctgatgat 300
 acagaagcta ttgccgcaca aaaacctgat ttaatcatgg ttttcgatca agatccaaac 360
 atcaatactc tgaaaaaaat tgcaccaact ttagttatta aatatgggtgc acaaaattat 420
 ttagatatga tgccagcctt ggggaaagta ttcggtaaag aaaaagaagc taatcagtgg 480
 gttagccaat ggaaaactaa aactctcgct gtcaaaaaag atttacacca tatcttaaag 540
 cctaactacta cttttactat tatggatttt tatgataaaa atatctattt atatggtaat 600
 aattttggac gcggtggaga actaatctat gattcactag gttatgctgc cccagaaaaa 660
 gtcaaaaaag atgtctttta aaaagggtgg tttaccgttt cgcaagaagc aatcggtgat 720

tacgttggag attatgccct tgttaatata aacaaaacga ctaaaaaagc agcttcatca	780
cttaaagaaa gtgatgtctg gaagaattta ccagctgtca aaaaagggca catcatagaa	840
agtaactacg acgtgtttta tttctctgac cctctatctt tagaagctca attaaaatca	900
tttacaagg ctatcaaaga aaatacaaat	930

<210> 53
 <211> 310
 <212> PRT
 <213> Streptococcus agalactiae

<400> 53

Met	Lys	Lys	Ile	Gly	Ile	Ile	Val	Leu	Thr	Leu	Leu	Thr	Phe	Phe	Leu
1				5					10					15	
Val	Ser	Cys	Gly	Gln	Gln	Thr	Lys	Gln	Glu	Ser	Thr	Lys	Thr	Thr	Ile
			20					25					30		
Ser	Lys	Met	Pro	Lys	Ile	Glu	Gly	Phe	Thr	Tyr	Tyr	Gly	Lys	Ile	Pro
		35					40					45			
Glu	Asn	Pro	Lys	Lys	Val	Ile	Asn	Phe	Thr	Tyr	Ser	Tyr	Thr	Gly	Tyr
	50					55					60				
Leu	Leu	Lys	Leu	Gly	Val	Asn	Val	Ser	Ser	Tyr	Ser	Leu	Asp	Leu	Glu
65					70					75					80
Lys	Asp	Ser	Pro	Val	Phe	Gly	Lys	Gln	Leu	Lys	Glu	Ala	Lys	Lys	Leu
				85					90					95	
Thr	Ala	Asp	Asp	Thr	Glu	Ala	Ile	Ala	Ala	Gln	Lys	Pro	Asp	Leu	Ile
			100					105					110		
Met	Val	Phe	Asp	Gln	Asp	Pro	Asn	Ile	Asn	Thr	Leu	Lys	Lys	Ile	Ala
		115					120					125			
Pro	Thr	Leu	Val	Ile	Lys	Tyr	Gly	Ala	Gln	Asn	Tyr	Leu	Asp	Met	Met
	130					135					140				
Pro	Ala	Leu	Gly	Lys	Val	Phe	Gly	Lys	Glu	Lys	Glu	Ala	Asn	Gln	Trp
145					150					155					160
Val	Ser	Gln	Trp	Lys	Thr	Lys	Thr	Leu	Ala	Val	Lys	Lys	Asp	Leu	His
				165					170					175	
His	Ile	Leu	Lys	Pro	Asn	Thr	Thr	Phe	Thr	Ile	Met	Asp	Phe	Tyr	Asp
			180					185					190		
Lys	Asn	Ile	Tyr	Leu	Tyr	Gly	Asn	Asn	Phe	Gly	Arg	Gly	Gly	Glu	Leu
	195						200					205			
Ile	Tyr	Asp	Ser	Leu	Gly	Tyr	Ala	Ala	Pro	Glu	Lys	Val	Lys	Lys	Asp
	210					215					220				
Val	Phe	Lys	Lys	Gly	Trp	Phe	Thr	Val	Ser	Gln	Glu	Ala	Ile	Gly	Asp
225					230					235					240
Tyr	Val	Gly	Asp	Tyr	Ala	Leu	Val	Asn	Ile	Asn	Lys	Thr	Thr	Lys	Lys
				245					250					255	
Ala	Ala	Ser	Ser	Leu	Lys	Glu	Ser	Asp	Val	Trp	Lys	Asn	Leu	Pro	Ala
			260					265					270		
Val	Lys	Lys	Gly	His	Ile	Ile	Glu	Ser	Asn	Tyr	Asp	Val	Phe	Tyr	Phe
	275						280					285			
Ser	Asp	Pro	Leu	Ser	Leu	Glu	Ala	Gln	Leu	Lys	Ser	Phe	Thr	Lys	Ala
	290					295					300				
Ile	Lys	Glu	Asn	Thr	Asn										
305					310										

<210> 54
 <211> 272
 <212> PRT

<213> Streptococcus agalactiae

<400> 54

Glu	Gly	Phe	Thr	Tyr	Tyr	Gly	Lys	Ile	Pro	Glu	Asn	Pro	Lys	Lys	Val
1				5				10						15	
Ile	Asn	Phe	Thr	Tyr	Ser	Tyr	Thr	Gly	Tyr	Leu	Leu	Lys	Leu	Gly	Val
			20					25					30		
Asn	Val	Ser	Ser	Tyr	Ser	Leu	Asp	Leu	Glu	Lys	Asp	Ser	Pro	Val	Phe
		35					40					45			
Gly	Lys	Gln	Leu	Lys	Glu	Ala	Lys	Lys	Leu	Thr	Ala	Asp	Asp	Thr	Glu
	50					55					60				
Ala	Ile	Ala	Ala	Gln	Lys	Pro	Asp	Leu	Ile	Met	Val	Phe	Asp	Gln	Asp
65					70					75					80
Pro	Asn	Ile	Asn	Thr	Leu	Lys	Lys	Ile	Ala	Pro	Thr	Leu	Val	Ile	Lys
			85						90					95	
Tyr	Gly	Ala	Gln	Asn	Tyr	Leu	Asp	Met	Met	Pro	Ala	Leu	Gly	Lys	Val
			100					105						110	
Phe	Gly	Lys	Glu	Lys	Glu	Ala	Asn	Gln	Trp	Val	Ser	Gln	Trp	Lys	Thr
		115					120					125			
Lys	Thr	Leu	Ala	Val	Lys	Lys	Asp	Leu	His	His	Ile	Leu	Lys	Pro	Asn
	130					135					140				
Thr	Thr	Phe	Thr	Ile	Met	Asp	Phe	Tyr	Asp	Lys	Asn	Ile	Tyr	Leu	Tyr
145					150					155					160
Gly	Asn	Asn	Phe	Gly	Arg	Gly	Gly	Glu	Leu	Ile	Tyr	Asp	Ser	Leu	Gly
			165					170						175	
Tyr	Ala	Ala	Pro	Glu	Lys	Val	Lys	Lys	Asp	Val	Phe	Lys	Lys	Gly	Trp
			180					185						190	
Phe	Thr	Val	Ser	Gln	Glu	Ala	Ile	Gly	Asp	Tyr	Val	Gly	Asp	Tyr	Ala
		195					200					205			
Leu	Val	Asn	Ile	Asn	Lys	Thr	Lys	Lys	Ala	Ala	Ser	Ser	Leu	Lys	
	210					215				220					
Glu	Ser	Asp	Val	Trp	Lys	Asn	Leu	Pro	Ala	Val	Lys	Lys	Gly	His	Ile
225					230					235					240
Ile	Glu	Ser	Asn	Tyr	Asp	Val	Phe	Tyr	Phe	Ser	Asp	Pro	Leu	Ser	Leu
			245						250					255	
Glu	Ala	Gln	Leu	Lys	Ser	Phe	Thr	Lys	Ala	Ile	Lys	Glu	Asn	Thr	Asn
			260					265					270		

<210> 55

<211> 302

<212> PRT

<213> Streptococcus agalactiae

<400> 55

Met	Lys	Lys	Ile	Gly	Ile	Ile	Val	Leu	Thr	Leu	Leu	Thr	Phe	Phe	Leu
1				5				10						15	
Val	Ser	Cys	Gly	Gln	Gln	Thr	Lys	Gln	Glu	Ser	Thr	Lys	Thr	Thr	Ile
			20					25					30		
Ser	Lys	Met	Pro	Lys	Ile	Glu	Gly	Phe	Thr	Tyr	Tyr	Gly	Lys	Ile	Pro
		35					40					45			
Glu	Asn	Pro	Lys	Lys	Val	Ile	Asn	Phe	Thr	Tyr	Ser	Tyr	Thr	Gly	Tyr
	50					55					60				
Leu	Leu	Lys	Leu	Gly	Val	Asn	Val	Ser	Ser	Tyr	Ser	Leu	Asp	Leu	Glu
65					70					75					80
Lys	Asp	Ser	Pro	Val	Phe	Gly	Lys	Gln	Leu	Lys	Glu	Ala	Lys	Lys	Leu

				85					90					95			
Thr	Ala	Asp	Asp	Thr	Glu	Ala	Ile	Ala	Ala	Gln	Lys	Pro	Asp	Leu	Ile		
			100					105					110				
Met	Val	Phe	Asp	Gln	Asp	Pro	Asn	Ile	Asn	Thr	Leu	Lys	Lys	Ile	Ala		
		115					120					125					
Pro	Thr	Leu	Val	Ile	Lys	Tyr	Gly	Ala	Gln	Asn	Tyr	Leu	Asp	Met	Met		
		130				135					140						
Pro	Ala	Leu	Gly	Lys	Val	Phe	Gly	Lys	Glu	Lys	Glu	Ala	Asn	Gln	Trp		
145					150					155					160		
Val	Ser	Gln	Trp	Lys	Thr	Lys	Thr	Leu	Ala	Val	Lys	Lys	Asp	Leu	His		
			165					170						175			
His	Ile	Leu	Lys	Pro	Asn	Thr	Thr	Phe	Thr	Ile	Met	Asp	Phe	Tyr	Asp		
		180						185					190				
Lys	Asn	Ile	Tyr	Leu	Tyr	Gly	Asn	Asn	Phe	Gly	Arg	Gly	Gly	Glu	Leu		
		195				200						205					
Ile	Tyr	Asp	Ser	Leu	Gly	Tyr	Ala	Ala	Pro	Glu	Lys	Val	Lys	Lys	Asp		
		210				215					220						
Val	Phe	Lys	Lys	Gly	Trp	Phe	Thr	Val	Ser	Gln	Glu	Ala	Ile	Gly	Asp		
225					230					235					240		
Tyr	Val	Gly	Asp	Tyr	Ala	Leu	Val	Asn	Ile	Asn	Lys	Thr	Thr	Lys	Lys		
			245					250						255			
Ala	Ala	Ser	Ser	Leu	Lys	Glu	Ser	Asp	Val	Trp	Lys	Asn	Leu	Pro	Ala		
			260					265					270				
Val	Lys	Lys	Gly	His	Ile	Ile	Glu	Ser	Asn	Tyr	Asp	Val	Phe	Tyr	Phe		
		275				280					285						
Ser	Asp	Pro	Leu	Ser	Leu	Glu	Ala	Gln	Leu	Lys	Ser	Phe	Thr				
	290					295					300						

<210> 56

<211> 264

<212> PRT

<213> Streptococcus agalactiae

<400> 56

Glu	Gly	Phe	Thr	Tyr	Tyr	Gly	Lys	Ile	Pro	Glu	Asn	Pro	Lys	Lys	Val		
1				5				10						15			
Ile	Asn	Phe	Thr	Tyr	Ser	Tyr	Thr	Gly	Tyr	Leu	Leu	Lys	Leu	Gly	Val		
			20					25					30				
Asn	Val	Ser	Ser	Tyr	Ser	Leu	Asp	Leu	Glu	Lys	Asp	Ser	Pro	Val	Phe		
		35					40					45					
Gly	Lys	Gln	Leu	Lys	Glu	Ala	Lys	Lys	Leu	Thr	Ala	Asp	Asp	Thr	Glu		
	50					55					60						
Ala	Ile	Ala	Ala	Gln	Lys	Pro	Asp	Leu	Ile	Met	Val	Phe	Asp	Gln	Asp		
65					70					75					80		
Pro	Asn	Ile	Asn	Thr	Leu	Lys	Lys	Ile	Ala	Pro	Thr	Leu	Val	Ile	Lys		
			85					90						95			
Tyr	Gly	Ala	Gln	Asn	Tyr	Leu	Asp	Met	Met	Pro	Ala	Leu	Gly	Lys	Val		
		100						105					110				
Phe	Gly	Lys	Glu	Lys	Glu	Ala	Asn	Gln	Trp	Val	Ser	Gln	Trp	Lys	Thr		
		115					120					125					
Lys	Thr	Leu	Ala	Val	Lys	Lys	Asp	Leu	His	His	Ile	Leu	Lys	Pro	Asn		
	130					135					140						
Thr	Thr	Phe	Thr	Ile	Met	Asp	Phe	Tyr	Asp	Lys	Asn	Ile	Tyr	Leu	Tyr		

145		150		155		160
Gly Asn Asn Phe	Gly Arg Gly Gly Glu Leu Ile Tyr Asp Ser Leu Gly					
	165		170			175
Tyr Ala Ala Pro	Glu Lys Val Lys Lys Asp Val Phe Lys Lys Gly Trp					
	180		185			190
Phe Thr Val Ser	Gln Glu Ala Ile Gly Asp Tyr Val Gly Asp Tyr Ala					
	195		200			205
Leu Val Asn Ile	Asn Lys Thr Thr Lys Lys Ala Ala Ser Ser Leu Lys					
	210		215			220
Glu Ser Asp Val	Trp Lys Asn Leu Pro Ala Val Lys Lys Gly His Ile					
225		230		235		240
Ile Glu Ser Asn	Tyr Asp Val Phe Tyr Phe Ser Asp Pro Leu Ser Leu					
	245		250			255
Glu Ala Gln Leu	Lys Ser Phe Thr					
	260					

<210> 57
 <211> 576
 <212> DNA
 <213> Streptococcus agalactiae

<400> 57
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 acgaccttat ctgaggagaa aagatcagat gaactagacc agtctagtac tggttcttct 180
 tctgaaaatg aatcgagttc atcaagtga ccagaaacaa atccgtcaac taatccacct 240
 acaacagaac catcgcaacc ctcacctagt gaagagaaca agcctgatgg tagaacgaag 300
 acagaaattg gcaataataa ggatatttct agtggaacaa aagtattaat ttcagaagat 360
 agtattaaga attttagtaa agcaagtagt gatcaagaag aagtggatcg cgatgaatca 420
 tcatcttcaa aagcaaatga tgggaaaaaa ggccacagta agcctaaaaa ggaacttcct 480
 aaaacaggag atagccactc agatactgta atagcatcta cgggagggat tattctgtta 540
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<210> 58
 <211> 192
 <212> PRT
 <213> Streptococcus agalactiae

<400> 58
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 20 25 30
 Asn Thr Asp Thr Ser Val Val Thr Thr Leu Ser Glu Glu Lys Arg
 35 40 45
 Ser Asp Glu Leu Asp Gln Ser Ser Thr Gly Ser Ser Glu Asn Glu
 50 55 60
 Ser Ser Ser Ser Ser Glu Pro Glu Thr Asn Pro Ser Thr Asn Pro Pro
 65 70 75 80
 Thr Thr Glu Pro Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp
 85 90 95
 Gly Arg Thr Lys Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly
 100 105 110
 Thr Lys Val Leu Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala

		115					120				125					
Ser	Ser	Asp	Gln	Glu	Glu	Val	Asp	Arg	Asp	Glu	Ser	Ser	Ser	Ser	Lys	
	130						135				140					
Ala	Asn	Asp	Gly	Lys	Lys	Gly	His	Ser	Lys	Pro	Lys	Lys	Glu	Leu	Pro	
145					150					155					160	
Lys	Thr	Gly	Asp	Ser	His	Ser	Asp	Thr	Val	Ile	Ala	Ser	Thr	Gly	Gly	
				165					170					175		
Ile	Ile	Leu	Leu	Ser	Leu	Ser	Phe	Tyr	Asn	Lys	Lys	Met	Lys	Leu	Tyr	
		180						185					190			

<210> 59
 <211> 165
 <212> PRT
 <213> Streptococcus agalactiae

<400> 59

Asp	Thr	Ser	Asp	Lys	Asn	Thr	Asp	Thr	Ser	Val	Val	Thr	Thr	Thr	Leu	
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Ser	Glu	Glu	Lys	Arg	Ser	Asp	Glu	Leu	Asp	Gln	Ser	Ser	Thr	Gly	Ser	
			20					25					30			
Ser	Ser	Glu	Asn	Glu	Ser	Ser	Ser	Ser	Ser	Glu	Pro	Glu	Thr	Asn	Pro	
		35				40						45				
Ser	Thr	Asn	Pro	Pro	Thr	Thr	Glu	Pro	Ser	Gln	Pro	Ser	Pro	Ser	Glu	
	50					55					60					
Glu	Asn	Lys	Pro	Asp	Gly	Arg	Thr	Lys	Thr	Glu	Ile	Gly	Asn	Asn	Lys	
65				70					75						80	
Asp	Ile	Ser	Ser	Gly	Thr	Lys	Val	Leu	Ile	Ser	Glu	Asp	Ser	Ile	Lys	
			85					90						95		
Asn	Phe	Ser	Lys	Ala	Ser	Ser	Asp	Gln	Glu	Glu	Val	Asp	Arg	Asp	Glu	
			100					105					110			
Ser	Ser	Ser	Ser	Lys	Ala	Asn	Asp	Gly	Lys	Lys	Gly	His	Ser	Lys	Pro	
		115				120						125				
Lys	Lys	Glu	Leu	Pro	Lys	Thr	Gly	Asp	Ser	His	Ser	Asp	Thr	Val	Ile	
	130					135						140				
Ala	Ser	Thr	Gly	Gly	Ile	Ile	Leu	Leu	Ser	Leu	Ser	Phe	Tyr	Asn	Lys	
145					150					155					160	
Lys	Met	Lys	Leu	Tyr												
				165												

<210> 60
 <211> 140
 <212> PRT
 <213> Streptococcus agalactiae

<400> 60

Asp	Gln	Ser	Ser	Thr	Gly	Ser	Ser	Ser	Glu	Asn	Glu	Ser	Ser	Ser	Ser	
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Ser	Glu	Pro	Glu	Thr	Asn	Pro	Ser	Thr	Asn	Pro	Pro	Thr	Thr	Glu	Pro	
			20					25					30			
Ser	Gln	Pro	Ser	Pro	Ser	Glu	Glu	Asn	Lys	Pro	Asp	Gly	Arg	Thr	Lys	
		35				40						45				
Thr	Glu	Ile	Gly	Asn	Asn	Lys	Asp	Ile	Ser	Ser	Gly	Thr	Lys	Val	Leu	
	50					55					60					
Ile	Ser	Glu	Asp	Ser	Ile	Lys	Asn	Phe	Ser	Lys	Ala	Ser	Ser	Asp	Gln	
65					70					75					80	

Glu	Glu	Val	Asp	Arg	Asp	Glu	Ser	Ser	Ser	Ser	Lys	Ala	Asn	Asp	Gly
			85						90					95	
Lys	Lys	Gly	His	Ser	Lys	Pro	Lys	Lys	Glu	Leu	Pro	Lys	Thr	Gly	Asp
			100					105					110		
Ser	His	Ser	Asp	Thr	Val	Ile	Ala	Ser	Thr	Gly	Gly	Ile	Ile	Leu	Leu
		115					120					125			
Ser	Leu	Ser	Phe	Tyr	Asn	Lys	Lys	Met	Lys	Leu	Tyr				
	130					135					140				

<210> 61
 <211> 158
 <212> PRT
 <213> Streptococcus agalactiae

<400> 61

Met	Lys	Val	Lys	Asn	Lys	Ile	Leu	Thr	Met	Val	Ala	Leu	Thr	Val	Leu
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Thr	Cys	Ala	Thr	Tyr	Ser	Ser	Ile	Gly	Tyr	Ala	Asp	Thr	Ser	Asp	Lys
			20					25					30		
Asn	Thr	Asp	Thr	Ser	Val	Val	Thr	Thr	Thr	Leu	Ser	Glu	Glu	Lys	Arg
		35				40						45			
Ser	Asp	Glu	Leu	Asp	Gln	Ser	Ser	Thr	Gly	Ser	Ser	Ser	Glu	Asn	Glu
	50				55						60				
Ser	Ser	Ser	Ser	Ser	Glu	Pro	Glu	Thr	Asn	Pro	Ser	Thr	Asn	Pro	Pro
65					70				75					80	
Thr	Thr	Glu	Pro	Ser	Gln	Pro	Ser	Pro	Ser	Glu	Glu	Asn	Lys	Pro	Asp
			85					90					95		
Gly	Arg	Thr	Lys	Thr	Glu	Ile	Gly	Asn	Asn	Lys	Asp	Ile	Ser	Ser	Gly
			100				105					110			
Thr	Lys	Val	Leu	Ile	Ser	Glu	Asp	Ser	Ile	Lys	Asn	Phe	Ser	Lys	Ala
		115				120					125				
Ser	Ser	Asp	Gln	Glu	Glu	Val	Asp	Arg	Asp	Glu	Ser	Ser	Ser	Ser	Lys
	130					135					140				
Ala	Asn	Asp	Gly	Lys	Lys	Gly	His	Ser	Lys	Pro	Lys	Lys	Glu		
145					150				155						

<210> 62
 <211> 131
 <212> PRT
 <213> Streptococcus agalactiae

<400> 62

Asp	Thr	Ser	Asp	Lys	Asn	Thr	Asp	Thr	Ser	Val	Val	Thr	Thr	Thr	Leu
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Ser	Glu	Glu	Lys	Arg	Ser	Asp	Glu	Leu	Asp	Gln	Ser	Ser	Thr	Gly	Ser
		20						25					30		
Ser	Ser	Glu	Asn	Glu	Ser	Ser	Ser	Ser	Ser	Glu	Pro	Glu	Thr	Asn	Pro
		35				40						45			
Ser	Thr	Asn	Pro	Pro	Thr	Thr	Glu	Pro	Ser	Gln	Pro	Ser	Pro	Ser	Glu
	50				55						60				
Glu	Asn	Lys	Pro	Asp	Gly	Arg	Thr	Lys	Thr	Glu	Ile	Gly	Asn	Asn	Lys
65					70				75					80	
Asp	Ile	Ser	Ser	Gly	Thr	Lys	Val	Leu	Ile	Ser	Glu	Asp	Ser	Ile	Lys
			85					90					95		
Asn	Phe	Ser	Lys	Ala	Ser	Ser	Asp	Gln	Glu	Glu	Val	Asp	Arg	Asp	Glu

100 105 110
 Ser Ser Ser Ser Lys Ala Asn Asp Gly Lys Lys Gly His Ser Lys Pro
 115 120 125
 Lys Lys Glu
 130

<210> 63
 <211> 106
 <212> PRT
 <213> Streptococcus agalactiae

<400> 63
 Asp Gln Ser Ser Thr Gly Ser Ser Ser Glu Asn Glu Ser Ser Ser Ser
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 20 25 30
 Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp Gly Arg Thr Lys
 35 40 45
 Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly Thr Lys Val Leu
 50 55 60
 Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala Ser Ser Asp Gln
 65 70 75 80
 Glu Glu Val Asp Arg Asp Glu Ser Ser Ser Ser Lys Ala Asn Asp Gly
 85 90 95
 Lys Lys Gly His Ser Lys Pro Lys Lys Glu
 100 105

<210> 64
 <211> 924
 <212> DNA
 <213> Streptococcus agalactiae

<400> 64
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 ccagtatatt ccattacaaa agcagtttct ggtgatttga atgatattaa aatgattcga 180
 tcacagtcag gtattcatgg ttttgaaccc tcatcaagtg atgttgctgc catttatgat 240
 gctgatctat ttcttttatca ttcgcacaca ctagaagctt gggcgagacg tttggaacct 300
 agtttgcata actctaaagt atctgtaatt gaagcttcaa aaggtatgac tttggataaa 360
 gttcatggct tagaagatgt agaggcagaa aaaggagtag atgagtcaac cttgtatgac 420
 cctcacactt ggaatgacct tgtaaaagta tctgaggaag cacaactcat cgctacacaa 480
 ttagctaaaa aggatcctaa aaacgctaag gtttatcaaa aaaatgctga tcaatttagt 540
 gacaaggcaa tggctattgc agagaagtat aagccaaaat tttaaagctgc aaagtctaaa 600
 tactttgtga cttcacatac agcattctca tacttagcta agcgatacgg attgactcag 660
 ttaggtattg caggtgtctc aaccgagcaa gaacctagtg ctaaaaaatt agccgaaatt 720
 caggagtttg tgaaaacata taaggtttaag actatttttg ttgaagaagg agtctcacct 780
 aaattagctc aagcagtagc ttcagctact cgagttaaaa ttgcaagttt aagtccttta 840
 raagcagttc ccaaaaacaa taaagattac ttagaaaatt tggaaactaa tcttaaggta 900
 cttgtcaaat cgttaaatca atag 924

<210> 65
 <211> 307
 <212> PRT
 <213> Streptococcus agalactiae

<220>
 <221> VARIANT
 <222> (1)...(307)
 <223> Xaa = Any Amino Acid

<400> 65
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 Leu Ser Val Val Thr Ser Phe Tyr Pro Val Tyr Ser Ile Thr Lys Ala
 35 40 45
 Val Ser Gly Asp Leu Asn Asp Ile Lys Met Ile Arg Ser Gln Ser Gly
 50 55 60
 Ile His Gly Phe Glu Pro Ser Ser Ser Asp Val Ala Ala Ile Tyr Asp
 65 70 75 80
 Ala Asp Leu Phe Leu Tyr His Ser His Thr Leu Glu Ala Trp Ala Arg
 85 90 95
 Arg Leu Glu Pro Ser Leu His His Ser Lys Val Ser Val Ile Glu Ala
 100 105 110
 Ser Lys Gly Met Thr Leu Asp Lys Val His Gly Leu Glu Asp Val Glu
 115 120 125
 Ala Glu Lys Gly Val Asp Glu Ser Thr Leu Tyr Asp Pro His Thr Trp
 130 135 140
 Asn Asp Pro Val Lys Val Ser Glu Glu Ala Gln Leu Ile Ala Thr Gln
 145 150 155 160
 Leu Ala Lys Lys Asp Pro Lys Asn Ala Lys Val Tyr Gln Lys Asn Ala
 165 170 175
 Asp Gln Phe Ser Asp Lys Ala Met Ala Ile Ala Glu Lys Tyr Lys Pro
 180 185 190
 Lys Phe Lys Ala Ala Lys Ser Lys Tyr Phe Val Thr Ser His Thr Ala
 195 200 205
 Phe Ser Tyr Leu Ala Lys Arg Tyr Gly Leu Thr Gln Leu Gly Ile Ala
 210 215 220
 Gly Val Ser Thr Glu Gln Glu Pro Ser Ala Lys Lys Leu Ala Glu Ile
 225 230 235 240
 Gln Glu Phe Val Lys Thr Tyr Lys Val Lys Thr Ile Phe Val Glu Glu
 245 250 255
 Gly Val Ser Pro Lys Leu Ala Gln Ala Val Ala Ser Ala Thr Arg Val
 260 265 270
 Lys Ile Ala Ser Leu Ser Pro Leu Xaa Ala Val Pro Lys Asn Asn Lys
 275 280 285
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 290 295 300
 Leu Asn Gln
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<210> 66
 <211> 1134
 <212> DNA
 <213> Streptococcus agalactiae

<400> 66
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aacgaaaaat tacgcttaga taaaagaagt aaattaaata tttcttctcc tgaagaacct 180
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gcacctatat ttgtagtagc attcctagtc attttagttt ccgttttcct actaactcct 360
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atagagaaaa cgaatattca aaaaaacgat tatttctttt ctttaatttt taaacataaa 480
gctattgaac aacgttttagc tgcagaagat gtatgggtaa aaacagctca gatgacttat 540
caatttccca ataagtttca tattcaagtt caagaaaata agattattgc atatgcacat 600
acaaagcaag gatatcaacc tgtcttgga actggaaaaa aggctgatcc tgtaaatagt 660
tcagagctac caaagcactt cttacaatt aaccttgata aggaagatag tattaagcta 720
ttaattaaag atttaaaggc ttttagacct gatttaataa gtgagattca ggtgataagt 780
ttagctgatt ctaaaacgac acctgacctc ctgctgttag atatgcacga tggaaatagt 840
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aaccttaagg aaccttctat tgttgatatg gaagtgggag tttacacaa aacaaatacc 960
attgaatcaa cccctgttaa agcagaagat acaaaaaata aatcaactga taaaacacaa 1020
acacaaaatg gtcaggttgc ggaaaatagt caaggacaaa caaataactc aaataactat 1080
caacaaggac aacagatagc aacagagcag gcacctaac ctcaaaatgt taat 1134

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<210> 67

<211> 378

<212> PRT

<213> Streptococcus agalactiae

<400> 67

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Met Pro Lys Lys Lys Ser Asp Thr Pro Glu Lys Glu Glu Val Val Leu
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20      25      30
Asp Glu Glu Gln Lys Arg Ile Asn Glu Lys Leu Arg Leu Asp Lys
35      40      45
Arg Ser Lys Leu Asn Ile Ser Ser Pro Glu Glu Pro Gln Asn Thr Thr
50      55      60
Lys Ile Lys Lys Leu His Phe Pro Lys Ile Ser Arg Pro Lys Ile Glu
65      70      75      80
Lys Lys Gln Lys Lys Glu Lys Ile Val Asn Ser Leu Ala Lys Thr Asn
85      90      95
Arg Ile Arg Thr Ala Pro Ile Phe Val Val Ala Phe Leu Val Ile Leu
100     105     110
Val Ser Val Phe Leu Leu Thr Pro Phe Ser Lys Gln Lys Thr Ile Thr
115     120     125
Val Ser Gly Asn Gln His Thr Pro Asp Asp Ile Leu Ile Glu Lys Thr
130     135     140
Asn Ile Gln Lys Asn Asp Tyr Phe Phe Ser Leu Ile Phe Lys His Lys
145     150     155     160
Ala Ile Glu Gln Arg Leu Ala Ala Glu Asp Val Trp Val Lys Thr Ala
165     170     175
Gln Met Thr Tyr Gln Phe Pro Asn Lys Phe His Ile Gln Val Gln Glu
180     185     190
Asn Lys Ile Ala Tyr Ala His Thr Lys Gln Gly Tyr Gln Pro Val
195     200     205
Leu Glu Thr Gly Lys Lys Ala Asp Pro Val Asn Ser Ser Glu Leu Pro
210     215     220
Lys His Phe Leu Thr Ile Asn Leu Asp Lys Glu Asp Ser Ile Lys Leu
225     230     235     240
Leu Ile Lys Asp Leu Lys Ala Leu Asp Pro Asp Leu Ile Ser Glu Ile

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gcaacagcat tatatagtga agaggataag gcgtttttatt caccacgtca gcaaggtgca 1920
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<210> 69
<211> 1233
<212> PRT
<213> Streptococcus agalactiae

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<400> 69
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 20             25             30
Gln Glu Leu Lys Asn Gln Glu Gln Ser Pro Val Ile Ala Asn Val Ala
 35             40             45
Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys Thr Ser
 50             55             60
Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly Asp Thr
 65             70             75             80
Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu Leu Ser
 85             90             95
Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu Glu Tyr
100            105            110
Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val Val Thr
115            120            125

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Asn	Ala	Ser	Thr	Ala	Ile	Ala	Gln	Lys	Val	Pro	Ser	Ala	Tyr	Glu	Glu	
130						135				140						
Val	Lys	Pro	Glu	Ser	Lys	Ser	Ser	Leu	Ala	Val	Leu	Asp	Thr	Ser	Lys	
145					150					155					160	
Ile	Thr	Lys	Leu	Gln	Ala	Ile	Thr	Gln	Arg	Gly	Lys	Gly	Asn	Val	Val	
				165					170					175		
Ala	Ile	Ile	Asp	Thr	Gly	Phe	Asp	Ile	Asn	His	Asp	Ile	Phe	Arg	Leu	
			180					185					190			
Asp	Ser	Pro	Lys	Asp	Asp	Lys	His	Ser	Phe	Lys	Thr	Lys	Thr	Glu	Phe	
	195					200						205				
Glu	Glu	Leu	Lys	Ala	Lys	His	Asn	Ile	Thr	Tyr	Gly	Lys	Trp	Val	Asn	
210					215						220					
Asp	Lys	Ile	Val	Phe	Ala	His	Asn	Tyr	Ala	Asn	Asn	Thr	Glu	Thr	Val	
225					230					235					240	
Ala	Asp	Ile	Ala	Ala	Ala	Met	Lys	Asp	Gly	Tyr	Gly	Ser	Glu	Ala	Lys	
				245					250					255		
Asn	Ile	Ser	His	Gly	Thr	His	Val	Ala	Gly	Ile	Phe	Val	Gly	Asn	Ser	
			260					265					270			
Lys	Arg	Pro	Ala	Ile	Asn	Gly	Leu	Leu	Leu	Glu	Gly	Ala	Ala	Pro	Asn	
	275					280						285				
Ala	Gln	Val	Leu	Leu	Met	Arg	Ile	Pro	Asp	Lys	Ile	Asp	Ser	Asp	Lys	
290					295					300						
Phe	Gly	Glu	Ala	Tyr	Ala	Lys	Ala	Ile	Thr	Asp	Ala	Val	Asn	Leu	Gly	
305					310					315					320	
Ala	Lys	Thr	Ile	Asn	Met	Ser	Ile	Gly	Lys	Thr	Ala	Asp	Ser	Leu	Ile	
				325					330					335		
Ala	Leu	Asn	Asp	Lys	Val	Lys	Leu	Ala	Leu	Lys	Leu	Ala	Ser	Glu	Lys	
		340					345					350				
Gly	Val	Ala	Val	Val	Val	Ala	Ala	Gly	Asn	Glu	Gly	Ala	Phe	Gly	Met	
	355					360						365				
Asp	Tyr	Ser	Lys	Pro	Leu	Ser	Thr	Asn	Pro	Asp	Tyr	Gly	Thr	Val	Asn	
370					375					380						
Ser	Pro	Ala	Ile	Ser	Glu	Asp	Thr	Leu	Ser	Val	Ala	Ser	Tyr	Glu	Ser	
385					390					395					400	
Leu	Lys	Thr	Ile	Ser	Glu	Val	Val	Glu	Thr	Thr	Ile	Glu	Gly	Lys	Leu	
				405					410					415		
Val	Lys	Leu	Pro	Ile	Val	Thr	Ser	Lys	Pro	Phe	Asp	Lys	Gly	Lys	Ala	
		420						425					430			
Tyr	Asp	Val	Val	Tyr	Ala	Asn	Tyr	Gly	Ala	Lys	Lys	Asp	Phe	Glu	Gly	
	435					440						445				
Lys	Asp	Phe	Lys	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Gly	Gly	Leu	
450					455						460					
Asp	Phe	Met	Thr	Lys	Ile	Thr	His	Ala	Thr	Asn	Ala	Gly	Val	Val	Gly	
465					470					475					480	
Ile	Val	Ile	Phe	Asn	Asp	Gln	Glu	Lys	Arg	Gly	Asn	Phe	Leu	Ile	Pro	
				485					490					495		
Tyr	Arg	Glu	Leu	Pro	Val	Gly	Ile	Ile	Ser	Lys	Val	Asp	Gly	Glu	Arg	
		500						505					510			
Ile	Lys	Asn	Thr	Ser	Ser	Gln	Leu	Thr	Phe	Asn	Gln	Ser	Phe	Glu	Val	
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Val	Asp	Ser	Gln	Gly	Gly	Asn	Arg	Met	Leu	Glu	Gln	Ser	Ser	Trp	Gly	
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Glu	Ile	Tyr	Ser	Ser	Thr	Tyr	Asn	Asn	Gln	Tyr	Gln	Thr	Met	Ser	Gly	

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Thr	Ser	Met	Ala	Ser	Pro	His	Val	Ala	Gly	Leu	Met	Thr	Met	Leu	Gln		
			580					585					590				
Ser	His	Leu	Ala	Glu	Lys	Tyr	Lys	Gly	Met	Asn	Leu	Asp	Ser	Lys	Lys		
		595					600					605					
Leu	Leu	Glu	Leu	Ser	Lys	Asn	Ile	Leu	Met	Ser	Ser	Ala	Thr	Ala	Leu		
	610					615					620						
Tyr	Ser	Glu	Glu	Asp	Lys	Ala	Phe	Tyr	Ser	Pro	Arg	Gln	Gln	Gly	Ala		
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Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr	Tyr	Ile	Thr		
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Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly	Val	Lys	Glu		
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Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp	Gln	Lys	Val		
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Gln	Phe	Ser	Gln	Lys	Leu	Lys	Glu	Gln	Met	Ala	Asn	Gly	Tyr	Phe	Leu		
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Ser	Ala	Pro	Phe	Glu	Ser	Asn	Asn	Tyr	Thr	Ala	Leu	Leu	Thr	Gln	Ser		
			820					825					830				
Ala	Ser	Trp	Gly	Tyr	Val	Asp	Tyr	Val	Lys	Asn	Gly	Gly	Glu	Leu	Glu		
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Lys	Val	Glu	Asp	Lys	Thr	Ile	His	Leu	Leu	Glu	Arg	Asp	Ala	Ala	Asn		
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			885						890					895			
Ile	Thr	Pro	Gln	Ala	Thr	Phe	Leu	Arg	Asn	Val	Lys	Asp	Ile	Ser	Ala		
		900						905					910				
Gln	Val	Leu	Asp	Gln	Asn	Gly	Asn	Val	Ile	Trp	Gln	Ser	Lys	Val	Leu		
	915					920						925					
Pro	Ser	Tyr	Arg	Lys	Asn	Phe	His	Asn	Asn	Pro	Lys	Gln	Ser	Asp	Gly		
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His	Tyr	Arg	Met	Asp	Ala	Leu	Gln	Trp	Ser	Gly	Leu	Asp	Lys	Asp	Gly		
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Lys	Val	Val	Ala	Asp	Gly	Phe	Tyr	Thr	Tyr	Arg	Leu	Arg	Tyr	Thr	Pro		
			965						970					975			
Val	Ala	Glu	Gly	Ala	Asn	Ser	Gln	Glu	Ser	Asp	Phe	Lys	Val	Gln	Val		
		980						985					990				
Ser	Thr	Lys	Ser	Pro	Asn	Leu	Pro	Ser	Arg	Ala	Gln	Phe	Asp	Glu	Thr		
		995					1000						1005				

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 Thr Tyr Arg Leu Gln Leu Val Leu Ser His Val Val Lys Asp Glu Glu
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 Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala Gly Asn
 1075 1080 1085
 Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val Val Ser
 1090 1095 1100
 Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr Phe Asp
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 Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys Val Val
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 Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn Glu Lys
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 1170 1175 1180
 Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr Leu Pro Ser Thr
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 Ser Asp Arg Ala Thr Asn Gly Leu Phe Val Gly Thr Leu Ala Leu Leu
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 Asp Thr Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu
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 Leu Ser Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu
 65 70 75 80
 Glu Tyr Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val
 85 90 95
 Val Thr Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr
 100 105 110
 Glu Glu Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr
 115 120 125
 Ser Lys Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn
 130 135 140

Val	Val	Ala	Ile	Ile	Asp	Thr	Gly	Phe	Asp	Ile	Asn	His	Asp	Ile	Phe
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Arg	Leu	Asp	Ser	Pro	Lys	Asp	Asp	Lys	His	Ser	Phe	Lys	Thr	Lys	Thr
				165					170						175
Glu	Phe	Glu	Glu	Leu	Lys	Ala	Lys	His	Asn	Ile	Thr	Tyr	Gly	Lys	Trp
			180					185					190		
Val	Asn	Asp	Lys	Ile	Val	Phe	Ala	His	Asn	Tyr	Ala	Asn	Asn	Thr	Glu
	195						200					205			
Thr	Val	Ala	Asp	Ile	Ala	Ala	Ala	Met	Lys	Asp	Gly	Tyr	Gly	Ser	Glu
	210					215					220				
Ala	Lys	Asn	Ile	Ser	His	Gly	Thr	His	Val	Ala	Gly	Ile	Phe	Val	Gly
225					230					235					240
Asn	Ser	Lys	Arg	Pro	Ala	Ile	Asn	Gly	Leu	Leu	Leu	Glu	Gly	Ala	Ala
				245					250						255
Pro	Asn	Ala	Gln	Val	Leu	Leu	Met	Arg	Ile	Pro	Asp	Lys	Ile	Asp	Ser
		260						265					270		
Asp	Lys	Phe	Gly	Glu	Ala	Tyr	Ala	Lys	Ala	Ile	Thr	Asp	Ala	Val	Asn
		275					280					285			
Leu	Gly	Ala	Lys	Thr	Ile	Asn	Met	Ser	Ile	Gly	Lys	Thr	Ala	Asp	Ser
	290					295					300				
Leu	Ile	Ala	Leu	Asn	Asp	Lys	Val	Lys	Leu	Ala	Leu	Lys	Leu	Ala	Ser
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Glu	Lys	Gly	Val	Ala	Val	Val	Val	Ala	Ala	Gly	Asn	Glu	Gly	Ala	Phe
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Gly	Met	Asp	Tyr	Ser	Lys	Pro	Leu	Ser	Thr	Asn	Pro	Asp	Tyr	Gly	Thr
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	355						360					365			
Glu	Ser	Leu	Lys	Thr	Ile	Ser	Glu	Val	Val	Glu	Thr	Thr	Ile	Glu	Gly
	370					375					380				
Lys	Leu	Val	Lys	Leu	Pro	Ile	Val	Thr	Ser	Lys	Pro	Phe	Asp	Lys	Gly
385					390					395					400
Lys	Ala	Tyr	Asp	Val	Val	Tyr	Ala	Asn	Tyr	Gly	Ala	Lys	Lys	Asp	Phe
			405						410					415	
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Gly	Leu	Asp	Phe	Met	Thr	Lys	Ile	Thr	His	Ala	Thr	Asn	Ala	Gly	Val
	435						440					445			
Val	Gly	Ile	Val	Ile	Phe	Asn	Asp	Gln	Glu	Lys	Arg	Gly	Asn	Phe	Leu
	450					455					460				
Ile	Pro	Tyr	Arg	Glu	Leu	Pro	Val	Gly	Ile	Ile	Ser	Lys	Val	Asp	Gly
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Glu	Arg	Ile	Lys	Asn	Thr	Ser	Ser	Gln	Leu	Thr	Phe	Asn	Gln	Ser	Phe
			485						490					495	
Glu	Val	Val	Asp	Ser	Gln	Gly	Gly	Asn	Arg	Met	Leu	Glu	Gln	Ser	Ser
			500					505					510		
Trp	Gly	Val	Thr	Ala	Glu	Gly	Ala	Ile	Lys	Pro	Asp	Val	Thr	Ala	Ser
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Gly	Phe	Glu	Ile	Tyr	Ser	Ser	Thr	Tyr	Asn	Asn	Gln	Tyr	Gln	Thr	Met
	530					535					540				
Ser	Gly	Thr	Ser	Met	Ala	Ser	Pro	His	Val	Ala	Gly	Leu	Met	Thr	Met
545					550					555					560
Leu	Gln	Ser	His	Leu	Ala	Glu	Lys	Tyr	Lys	Gly	Met	Asn	Leu	Asp	Ser
				565					570					575	
Lys	Lys	Leu	Leu	Glu	Leu	Ser	Lys	Asn	Ile	Leu	Met	Ser	Ser	Ala	Thr

				580					585					590			
Ala	Leu	Tyr	Ser	Glu	Glu	Asp	Lys	Ala	Phe	Tyr	Ser	Pro	Arg	Gln	Gln		
		595					600					605					
Gly	Ala	Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr	Tyr		
	610					615					620						
Ile	Thr	Gly	Asn	Asp	Gly	Lys	Ala	Lys	Ile	Asn	Leu	Lys	Arg	Met	Gly		
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Asp	Lys	Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly	Val		
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Lys	Glu	Leu	Tyr	Tyr	Gln	Ala	Asn	Val	Ala	Thr	Glu	Gln	Val	Asn	Lys		
			660					665					670				
Gly	Lys	Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp	Gln		
		675					680					685					
Lys	Val	Ile	Leu	Arg	Asp	Lys	Glu	Thr	Gln	Val	Arg	Phe	Thr	Ile	Asp		
	690					695					700						
Ala	Ser	Gln	Phe	Ser	Gln	Lys	Leu	Lys	Glu	Gln	Met	Ala	Asn	Gly	Tyr		
705					710				715						720		
Phe	Leu	Glu	Gly	Phe	Val	Arg	Phe	Lys	Glu	Ala	Lys	Asp	Ser	Asn	Gln		
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			740					745				750					
Leu	Gln	Ala	Leu	Glu	Thr	Pro	Ile	Tyr	Lys	Thr	Leu	Ser	Lys	Gly	Ser		
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Phe	Tyr	Tyr	Lys	Pro	Asn	Asp	Thr	Thr	His	Lys	Asp	Gln	Leu	Glu	Tyr		
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Asn	Glu	Ser	Ala	Pro	Phe	Glu	Ser	Asn	Asn	Tyr	Thr	Ala	Leu	Leu	Thr		
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Gln	Ser	Ala	Ser	Trp	Gly	Tyr	Val	Asp	Tyr	Val	Lys	Asn	Gly	Gly	Glu		
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Ala	Asn	Asn	Pro	Tyr	Phe	Ala	Ile	Ser	Pro	Asn	Lys	Asp	Gly	Asn	Arg		
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Ser	Ala	Gln	Val	Leu	Asp	Gln	Asn	Gly	Asn	Val	Ile	Trp	Gln	Ser	Lys		
			885					890					895				
Val	Leu	Pro	Ser	Tyr	Arg	Lys	Asn	Phe	His	Asn	Asn	Pro	Lys	Gln	Ser		
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Asp	Gly	His	Tyr	Arg	Met	Asp	Ala	Leu	Gln	Trp	Ser	Gly	Leu	Asp	Lys		
	915						920					925					
Asp	Gly	Lys	Val	Val	Ala	Asp	Gly	Phe	Tyr	Thr	Tyr	Arg	Leu	Arg	Tyr		
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Thr	Pro	Val	Ala	Glu	Gly	Ala	Asn	Ser	Gln	Glu	Ser	Asp	Phe	Lys	Val		
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Gln	Val	Ser	Thr	Lys	Ser	Pro	Asn	Leu	Pro	Ser	Arg	Ala	Gln	Phe	Asp		
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Glu	Thr	Asn	Arg	Thr	Leu	Ser	Leu	Ala	Met	Pro	Lys	Glu	Ser	Ser	Tyr		
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 Val Val Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr
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 Ile Ile Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr Leu Pro
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 Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys Thr Ser
 50 55 60
 Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly Asp Thr
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 Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu Leu Ser
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 Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu Tyr
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 Pro Ser Lys Pro Glu Thr Thr Asn Lys Glu Ser Asn Val Val Thr
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 Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr Glu Glu
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 Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr Ser Lys
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 Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn Val Val
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 Ala Ile Ile Asp Thr Gly Phe Asp Ile Asn His Asp Ile Phe Arg Leu
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Glu	Glu	Leu	Lys	Ala	Lys	His	Asn	Ile	Thr	Tyr	Gly	Lys	Trp	Val	Asn		
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Ala	Asp	Ile	Ala	Ala	Ala	Met	Lys	Asp	Gly	Tyr	Gly	Ser	Glu	Ala	Lys		
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Ala	Lys	Thr	Ile	Asn	Met	Ser	Ile	Gly	Lys	Thr	Ala	Asp	Ser	Leu	Ile		
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Lys	Asp	Phe	Lys	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Gly	Gly	Leu		
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Ile	Lys	Asn	Thr	Ser	Ser	Gln	Leu	Thr	Phe	Asn	Gln	Ser	Phe	Glu	Val		
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Val	Asp	Ser	Gln	Gly	Gly	Asn	Arg	Met	Leu	Glu	Gln	Ser	Ser	Trp	Gly		
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Val	Thr	Ala	Glu	Gly	Ala	Ile	Lys	Pro	Asp	Val	Thr	Ala	Ser	Gly	Phe		
545					550					555					560		
Glu	Ile	Tyr	Ser	Ser	Thr	Tyr	Asn	Asn	Gln	Tyr	Gln	Thr	Met	Ser	Gly		
				565					570					575			
Thr	Ser	Met	Ala	Ser	Pro	His	Val	Ala	Gly	Leu	Met	Thr	Met	Leu	Gln		
			580				585						590				
Ser	His	Leu	Ala	Glu	Lys	Tyr	Lys	Gly	Met	Asn	Leu	Asp	Ser	Lys	Lys		
		595				600						605					
Leu	Leu	Glu	Leu	Ser	Lys	Asn	Ile	Leu	Met	Ser	Ser	Ala	Thr	Ala	Leu		
	610					615					620						
Tyr	Ser	Glu	Glu	Asp	Lys	Ala	Phe	Tyr	Ser	Pro	Arg	Gln	Gln	Gly	Ala		

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Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr	Tyr	Ile
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Gly	Asn	Asp	Gly	Lys	Ala	Lys	Ile	Asn	Leu	Lys	Arg	Met	Gly	Asp
				660					665					670
Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly	Val	Lys
				675					680					685
Leu	Tyr	Tyr	Gln	Ala	Asn	Val	Ala	Thr	Glu	Gln	Val	Asn	Lys	Gly
				690					695					700
Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp	Gln	Lys
705					710									720
Ile	Leu	Arg	Asp	Lys	Glu	Thr	Gln	Val	Arg	Phe	Thr	Ile	Asp	Ala
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Gln	Phe	Ser	Gln	Lys	Leu	Lys	Glu	Gln	Met	Ala	Asn	Gly	Tyr	Phe
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Glu	Gly	Phe	Val	Arg	Phe	Lys	Glu	Ala	Lys	Asp	Ser	Asn	Gln	Glu
				755					760					765
Met	Ser	Ile	Pro	Phe	Val	Gly	Phe	Asn	Gly	Asp	Phe	Ala	Asn	Leu
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Ala	Leu	Glu	Thr	Pro	Ile	Tyr	Lys	Thr	Leu	Ser	Lys	Gly	Ser	Phe
785					790									800
Tyr	Lys	Pro	Asn	Asp	Thr	Thr	His	Lys	Asp	Gln	Leu	Glu	Tyr	Asn
				805					810					815
Ser	Ala	Pro	Phe	Glu	Ser	Asn	Asn	Tyr	Thr	Ala	Leu	Leu	Thr	Gln
				820					825					830
Ala	Ser	Trp	Gly	Tyr	Val	Asp	Tyr	Val	Lys	Asn	Gly	Gly	Glu	Leu
				835					840					845
Leu	Ala	Pro	Glu	Ser	Pro	Lys	Arg	Ile	Ile	Leu	Gly	Thr	Phe	Glu
				850										855
Lys	Val	Glu	Asp	Lys	Thr	Ile	His	Leu	Leu	Glu	Arg	Asp	Ala	Ala
865					870									880
Asn	Pro	Tyr	Phe	Ala	Ile	Ser	Pro	Asn	Lys	Asp	Gly	Asn	Arg	Asp
				885					890					895
Ile	Thr	Pro	Gln	Ala	Thr	Phe	Leu	Arg	Asn	Val	Lys	Asp	Ile	Ser
				900					905					910
Gln	Val	Leu	Asp	Gln	Asn	Gly	Asn	Val	Ile	Trp	Gln	Ser	Lys	Val
				915					920					925
Pro	Ser	Tyr	Arg	Lys	Asn	Phe	His	Asn	Asn	Pro	Lys	Gln	Ser	Asp
				930										935
His	Tyr	Arg	Met	Asp	Ala	Leu	Gln	Trp	Ser	Gly	Leu	Asp	Lys	Asp
945					950									955
Lys	Val	Val	Ala	Asp	Gly	Phe	Tyr	Thr	Tyr	Arg	Leu	Arg	Tyr	Thr
				965					970					975
Val	Ala	Glu	Gly	Ala	Asn	Ser	Gln	Glu	Ser	Asp	Phe	Lys	Val	Gln
				980					985					990
Ser	Thr	Lys	Ser	Pro	Asn	Leu	Pro	Ser	Arg	Ala	Gln	Phe	Asp	Glu
				995					1000					1005
Asn	Arg	Thr	Leu	Ser	Leu	Ala	Met	Pro	Lys	Glu	Ser	Ser	Tyr	Val
				1010					1015					1020
Thr	Tyr	Arg	Leu	Gln	Leu	Val	Leu	Ser	His	Val	Val	Lys	Asp	Glu
1025					1030									1035
Tyr	Gly	Asp	Glu	Thr	Ser	Tyr	His	Tyr	Phe	His	Ile	Asp	Gln	Glu
				1045					1050					1055
Lys	Val	Thr	Leu	Pro	Lys	Thr	Val	Lys	Ile	Gly	Glu	Ser	Glu	Val
				1060					1065					1070

Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala Gly Asn
 1075 1080 1085
 Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val Val Ser
 1090 1095 1100
 Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr Phe Asp
 1105 1110 1115 1120
 Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys Val Val
 1125 1130 1135
 Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr Thr Val
 1140 1145 1150

 Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn Glu Lys
 1155 1160 1165
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 1185 1190 1195

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 <213> Streptococcus agalactiae

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 35 40 45
 Asp Thr Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu
 50 55 60
 Leu Ser Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu
 65 70 75 80
 Glu Tyr Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val
 85 90 95
 Val Thr Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr
 100 105 110
 Glu Glu Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr
 115 120 125
 Ser Lys Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn
 130 135 140
 Val Val Ala Ile Ile Asp Thr Gly Phe Asp Ile Asn His Asp Ile Phe
 145 150 155 160
 Arg Leu Asp Ser Pro Lys Asp Asp Lys His Ser Phe Lys Thr Lys Thr
 165 170 175
 Glu Phe Glu Glu Leu Lys Ala Lys His Asn Ile Thr Tyr Gly Lys Trp
 180 185 190
 Val Asn Asp Lys Ile Val Phe Ala His Asn Tyr Ala Asn Asn Thr Glu
 195 200 205
 Thr Val Ala Asp Ile Ala Ala Ala Met Lys Asp Gly Tyr Gly Ser Glu
 210 215 220
 Ala Lys Asn Ile Ser His Gly Thr His Val Ala Gly Ile Phe Val Gly
 225 230 235 240
 Asn Ser Lys Arg Pro Ala Ile Asn Gly Leu Leu Leu Glu Gly Ala Ala

Pro	Asn	Ala	Gln	Val	Leu	Leu	Met	Arg	Ile	Pro	Asp	Lys	Ile	Asp	Ser
			260					265					270		
Asp	Lys	Phe	Gly	Glu	Ala	Tyr	Ala	Lys	Ala	Ile	Thr	Asp	Ala	Val	Asn
		275					280					285			
Leu	Gly	Ala	Lys	Thr	Ile	Asn	Met	Ser	Ile	Gly	Lys	Thr	Ala	Asp	Ser
	290					295					300				
Leu	Ile	Ala	Leu	Asn	Asp	Lys	Val	Lys	Leu	Ala	Leu	Lys	Leu	Ala	Ser
305					310					315					320
Glu	Lys	Gly	Val	Ala	Val	Val	Val	Ala	Ala	Gly	Asn	Glu	Gly	Ala	Phe
			325					330						335	
Gly	Met	Asp	Tyr	Ser	Lys	Pro	Leu	Ser	Thr	Asn	Pro	Asp	Tyr	Gly	Thr
			340					345					350		
Val	Asn	Ser	Pro	Ala	Ile	Ser	Glu	Asp	Thr	Leu	Ser	Val	Ala	Ser	Tyr
		355					360					365			
Glu	Ser	Leu	Lys	Thr	Ile	Ser	Glu	Val	Val	Glu	Thr	Thr	Ile	Glu	Gly
	370					375					380				
Lys	Leu	Val	Lys	Leu	Pro	Ile	Val	Thr	Ser	Lys	Pro	Phe	Asp	Lys	Gly
385					390					395					400
Lys	Ala	Tyr	Asp	Val	Val	Tyr	Ala	Asn	Tyr	Gly	Ala	Lys	Lys	Asp	Phe
			405					410						415	
Glu	Gly	Lys	Asp	Phe	Lys	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Gly
			420					425					430		
Gly	Leu	Asp	Phe	Met	Thr	Lys	Ile	Thr	His	Ala	Thr	Asn	Ala	Gly	Val
	435						440					445			
Val	Gly	Ile	Val	Ile	Phe	Asn	Asp	Gln	Glu	Lys	Arg	Gly	Asn	Phe	Leu
	450					455					460				
Ile	Pro	Tyr	Arg	Glu	Leu	Pro	Val	Gly	Ile	Ile	Ser	Lys	Val	Asp	Gly
465					470					475					480
Glu	Arg	Ile	Lys	Asn	Thr	Ser	Ser	Gln	Leu	Thr	Phe	Asn	Gln	Ser	Phe
			485					490						495	
Glu	Val	Val	Asp	Ser	Gln	Gly	Gly	Asn	Arg	Met	Leu	Glu	Gln	Ser	Ser
			500					505					510		
Trp	Gly	Val	Thr	Ala	Glu	Gly	Ala	Ile	Lys	Pro	Asp	Val	Thr	Ala	Ser
		515					520					525			
Gly	Phe	Glu	Ile	Tyr	Ser	Ser	Thr	Tyr	Asn	Asn	Gln	Tyr	Gln	Thr	Met
	530					535					540				
Ser	Gly	Thr	Ser	Met	Ala	Ser	Pro	His	Val	Ala	Gly	Leu	Met	Thr	Met
545					550					555					560
Leu	Gln	Ser	His	Leu	Ala	Glu	Lys	Tyr	Lys	Gly	Met	Asn	Leu	Asp	Ser
			565					570						575	
Lys	Lys	Leu	Leu	Glu	Leu	Ser	Lys	Asn	Ile	Leu	Met	Ser	Ser	Ala	Thr
			580					585					590		
Ala	Leu	Tyr	Ser	Glu	Glu	Asp	Lys	Ala	Phe	Tyr	Ser	Pro	Arg	Gln	Gln
		595					600					605			
Gly	Ala	Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr	Tyr
	610					615					620				
Ile	Thr	Gly	Asn	Asp	Gly	Lys	Ala	Lys	Ile	Asn	Leu	Lys	Arg	Met	Gly
625					630					635					640
Asp	Lys	Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly	Val
			645					650						655	
Lys	Glu	Leu	Tyr	Tyr	Gln	Ala	Asn	Val	Ala	Thr	Glu	Gln	Val	Asn	Lys
			660				665						670		
Gly	Lys	Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp	Gln
		675					680					685			

Thr Val Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn
1125 1130 1135
Glu Lys Val Leu Thr Ser Thr Asn Asn Asn Ser Ser Arg Val Ala Lys
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1155 1160 1165

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<212> DNA
<213> Streptococcus agalactiae

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aatactatcg ttcaaactaa tgacagtaat cctaccgcaa aatttgtatc agaatcagga 180
caatctgtaa taggtcaagt aaaaccagat aattctgcgg cgcttacaac agttgacacg 240
cctcatcata tttcagctcc agatgcttta aaaacaactc aatcaagtcc tgtcgttgag 300
agtacttcta ctaagttaac tgaagagact tacaacaaaa aagatgggtca agatttagcc 360
aacatgggtga gaagtgggtca agttactagt gaggaactcg ttaatatggc atacgatatt 420
attgctaaag aaaacccatc tttaaatgca gtcattacta ctagacgcca agaagctatt 480
gaagaggcta gaaaacttaa agataccaat cagccgtttt taggtgttcc cttgttagtc 540
aaggggttag ggcacagtat taaaggtggg gaaaccaata atggcttgat ctatgcagat 600
ggaaaaatta gcacatttga cagtagctat gtcaaaaaat ataaagattt aggatttatt 660
attttaggac aaacgaactt tccagagtat ggggtggcgta atataacaga ttctaaatta 720
tacggtctaa cgcataatcc ttgggatctt gtcataatg ctgggtggctc ttctgggtgga 780
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gttagtcaag atgctaaaaa cgctattatg gacaacgtca cattcttaag aaaacaagga 1140
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accttggtcta ttggcatggg aggagctttt tcaacaattg aaaaagactt aaaaaaacat 1260
ggtttttacta aagaagacgt tgatcctatt acttgggcag ttcatgttat ttatcaaaat 1320
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<212> PRT
<213> Streptococcus agalactiae

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			20					25					30			
Ser	Ala	Ser	Val	Val	Pro	Thr	Thr	Asn	Thr	Ile	Val	Gln	Thr	Asn	Asp	
		35					40					45				
Ser	Asn	Pro	Thr	Ala	Lys	Phe	Val	Ser	Glu	Ser	Gly	Gln	Ser	Val	Ile	
	50					55					60					
Gly	Gln	Val	Lys	Pro	Asp	Asn	Ser	Ala	Ala	Leu	Thr	Thr	Val	Asp	Thr	
65					70					75					80	
Pro	His	His	Ile	Ser	Ala	Pro	Asp	Ala	Leu	Lys	Thr	Thr	Gln	Ser	Ser	
			85						90					95		
Pro	Val	Val	Glu	Ser	Thr	Ser	Thr	Lys	Leu	Thr	Glu	Glu	Thr	Tyr	Lys	
			100					105					110			
Gln	Lys	Asp	Gly	Gln	Asp	Leu	Ala	Asn	Met	Val	Arg	Ser	Gly	Gln	Val	
		115					120					125				
Thr	Ser	Glu	Glu	Leu	Val	Asn	Met	Ala	Tyr	Asp	Ile	Ile	Ala	Lys	Glu	
	130					135					140					
Asn	Pro	Ser	Leu	Asn	Ala	Val	Ile	Thr	Thr	Arg	Arg	Gln	Glu	Ala	Ile	
145					150					155					160	
Glu	Glu	Ala	Arg	Lys	Leu	Lys	Asp	Thr	Asn	Gln	Pro	Phe	Leu	Gly	Val	
			165						170					175		
Pro	Leu	Leu	Val	Lys	Gly	Leu	Gly	His	Ser	Ile	Lys	Gly	Gly	Glu	Thr	
			180					185					190			
Asn	Asn	Gly	Leu	Ile	Tyr	Ala	Asp	Gly	Lys	Ile	Ser	Thr	Phe	Asp	Ser	
	195						200					205				
Ser	Tyr	Val	Lys	Lys	Tyr	Lys	Asp	Leu	Gly	Phe	Ile	Ile	Leu	Gly	Gln	
	210					215					220					
Thr	Asn	Phe	Pro	Glu	Tyr	Gly	Trp	Arg	Asn	Ile	Thr	Asp	Ser	Lys	Leu	
225					230					235					240	
Tyr	Gly	Leu	Thr	His	Asn	Pro	Trp	Asp	Leu	Ala	His	Asn	Ala	Gly	Gly	
			245						250					255		
Ser	Ser	Gly	Gly	Ser	Ala	Ala	Ala	Ile	Ala	Ser	Gly	Met	Thr	Pro	Ile	
			260					265					270			
Ala	Ser	Gly	Ser	Asp	Ala	Gly	Gly	Ser	Ile	Arg	Ile	Pro	Ser	Ser	Trp	
	275						280					285				
Thr	Gly	Leu	Val	Gly	Leu	Lys	Pro	Thr	Arg	Gly	Leu	Val	Ser	Asn	Glu	
	290					295					300					
Lys	Pro	Asp	Ser	Tyr	Ser	Thr	Ala	Val	His	Phe	Pro	Leu	Thr	Lys	Ser	
305					310					315					320	
Ser	Arg	Asp	Ala	Glu	Thr	Leu	Leu	Thr	Tyr	Leu	Lys	Lys	Ser	Asp	Gln	
			325						330					335		
Thr	Leu	Val	Ser	Val	Asn	Asp	Leu	Lys	Ser	Leu	Pro	Ile	Ala	Tyr	Thr	
			340					345					350			
Leu	Lys	Ser	Pro	Met	Gly	Thr	Glu	Val	Ser	Gln	Asp	Ala	Lys	Asn	Ala	
	355						360					365				
Ile	Met	Asp	Asn	Val	Thr	Phe	Leu	Arg	Lys	Gln	Gly	Phe	Lys	Val	Thr	
	370					375					380					
Glu	Ile	Asp	Leu	Pro	Ile	Asp	Gly	Arg	Ala	Leu	Met	Arg	Asp	Tyr	Ser	
385					390					395					400	
Thr	Leu	Ala	Ile	Gly	Met	Gly	Gly	Ala	Phe	Ser	Thr	Ile	Glu	Lys	Asp	
			405					410						415		
Leu	Lys	Lys	His	Gly	Phe	Thr	Lys	Glu	Asp	Val	Asp	Pro	Ile	Thr	Trp	
			420					425					430			
Ala	Val	His	Val	Ile	Tyr	Gln	Asn	Ser	Asp	Lys	Ala	Glu	Leu	Lys	Lys	
		435					440					445				

Ser Ile Met Glu Ala Gln Lys His Met Asp Asp Tyr Arg Lys Ala Met
 450 455 460
 Glu Lys Leu His Lys Gln Phe Pro Ile Phe Leu Ser Pro Thr Thr Ala
 465 470 475 480
 Ser Leu Ala Pro Leu Asn Thr Asp Pro Tyr Val Thr Glu Glu Asp Lys
 485 490 495
 Arg Ala Ile Tyr Asn Met Glu Asn Leu Ser Gln Glu Glu Arg Ile Ala
 500 505 510
 Leu Phe Asn Arg Gln Trp Glu Pro Met Leu Arg Arg Thr Pro Phe Thr
 515 520 525
 Gln Ile Ala Asn Met Thr Gly Leu Pro Ala Ile Ser Ile Pro Thr Tyr
 530 535 540
 Leu Ser Glu Ser Gly Leu Pro Ile Gly Thr Met Leu Met Ala Gly Ala
 545 550 555 560
 Asn Tyr Asp Met Val Leu Ile Lys Phe Ala Thr Phe Phe Glu Lys His
 565 570 575
 His Gly Phe Asn Val Lys Trp Gln Arg Ile Ile Asp Lys Glu Val Lys
 580 585 590
 Pro Ser Thr Gly Leu Ile Gln Pro Thr Asn Ser Leu Phe Lys Ala His
 595 600 605
 Ser Ser Leu Val Asn Leu Glu Glu Asn Ser Gln Val Thr Gln Val Ser
 610 615 620
 Ile Ser Lys Lys Trp Met Lys Ser Ser Val Lys Asn Lys Pro Ser Val
 625 630 635 640
 Met Ala Tyr Gln Lys Ala Leu Pro Lys Thr Gly Asp Thr Glu Ser Ser
 645 650 655
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 660 665 670
 Val Thr Lys Lys Asn Gln Lys Ser
 675 680

<210> 75
 <211> 642
 <212> PRT
 <213> Streptococcus agalactiae

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 Phe Val Ser Glu Ser Gly Gln Ser Val Ile Gly Gln Val Lys Pro Asp
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 Asn Ser Ala Ala Leu Thr Thr Val Asp Thr Pro His His Ile Ser Ala
 35 40 45
 Pro Asp Ala Leu Lys Thr Thr Gln Ser Ser Pro Val Val Glu Ser Thr
 50 55 60
 Ser Thr Lys Leu Thr Glu Glu Thr Tyr Lys Gln Lys Asp Gly Gln Asp
 65 70 75 80
 Leu Ala Asn Met Val Arg Ser Gly Gln Val Thr Ser Glu Glu Leu Val
 85 90 95
 Asn Met Ala Tyr Asp Ile Ile Ala Lys Glu Asn Pro Ser Leu Asn Ala
 100 105 110
 Val Ile Thr Thr Arg Arg Gln Glu Ala Ile Glu Glu Ala Arg Lys Leu
 115 120 125
 Lys Asp Thr Asn Gln Pro Phe Leu Gly Val Pro Leu Leu Val Lys Gly
 130 135 140

Leu	Gly	His	Ser	Ile	Lys	Gly	Gly	Glu	Thr	Asn	Asn	Gly	Leu	Ile	Tyr
145					150					155					160
Ala	Asp	Gly	Lys	Ile	Ser	Thr	Phe	Asp	Ser	Ser	Tyr	Val	Lys	Lys	Tyr
				165					170						175
Lys	Asp	Leu	Gly	Phe	Ile	Ile	Leu	Gly	Gln	Thr	Asn	Phe	Pro	Glu	Tyr
			180					185					190		
Gly	Trp	Arg	Asn	Ile	Thr	Asp	Ser	Lys	Leu	Tyr	Gly	Leu	Thr	His	Asn
		195					200					205			
Pro	Trp	Asp	Leu	Ala	His	Asn	Ala	Gly	Gly	Ser	Ser	Gly	Gly	Ser	Ala
	210					215					220				
Ala	Ala	Ile	Ala	Ser	Gly	Met	Thr	Pro	Ile	Ala	Ser	Gly	Ser	Asp	Ala
225					230					235					240
Gly	Gly	Ser	Ile	Arg	Ile	Pro	Ser	Ser	Trp	Thr	Gly	Leu	Val	Gly	Leu
				245					250					255	
Lys	Pro	Thr	Arg	Gly	Leu	Val	Ser	Asn	Glu	Lys	Pro	Asp	Ser	Tyr	Ser
			260					265					270		
Thr	Ala	Val	His	Phe	Pro	Leu	Thr	Lys	Ser	Ser	Arg	Asp	Ala	Glu	Thr
		275					280					285			
Leu	Leu	Thr	Tyr	Leu	Lys	Lys	Ser	Asp	Gln	Thr	Leu	Val	Ser	Val	Asn
	290					295					300				
Asp	Leu	Lys	Ser	Leu	Pro	Ile	Ala	Tyr	Thr	Leu	Lys	Ser	Pro	Met	Gly
305					310					315					320
Thr	Glu	Val	Ser	Gln	Asp	Ala	Lys	Asn	Ala	Ile	Met	Asp	Asn	Val	Thr
				325					330					335	
Phe	Leu	Arg	Lys	Gln	Gly	Phe	Lys	Val	Thr	Glu	Ile	Asp	Leu	Pro	Ile
			340					345					350		
Asp	Gly	Arg	Ala	Leu	Met	Arg	Asp	Tyr	Ser	Thr	Leu	Ala	Ile	Gly	Met
		355					360					365			
Gly	Gly	Ala	Phe	Ser	Thr	Ile	Glu	Lys	Asp	Leu	Lys	Lys	His	Gly	Phe
	370					375					380				
Thr	Lys	Glu	Asp	Val	Asp	Pro	Ile	Thr	Trp	Ala	Val	His	Val	Ile	Tyr
385					390					395					400
Gln	Asn	Ser	Asp	Lys	Ala	Glu	Leu	Lys	Lys	Ser	Ile	Met	Glu	Ala	Gln
				405					410					415	
Lys	His	Met	Asp	Asp	Tyr	Arg	Lys	Ala	Met	Glu	Lys	Leu	His	Lys	Gln
			420					425					430		
Phe	Pro	Ile	Phe	Leu	Ser	Pro	Thr	Thr	Ala	Ser	Leu	Ala	Pro	Leu	Asn
		435					440					445			
Thr	Asp	Pro	Tyr	Val	Thr	Glu	Glu	Asp	Lys	Arg	Ala	Ile	Tyr	Asn	Met
	450					455					460				
Glu	Asn	Leu	Ser	Gln	Glu	Glu	Arg	Ile	Ala	Leu	Phe	Asn	Arg	Gln	Trp
465					470					475					480
Glu	Pro	Met	Leu	Arg	Arg	Thr	Pro	Phe	Thr	Gln	Ile	Ala	Asn	Met	Thr
				485					490					495	
Gly	Leu	Pro	Ala	Ile	Ser	Ile	Pro	Thr	Tyr	Leu	Ser	Glu	Ser	Gly	Leu
			500					505					510		
Pro	Ile	Gly	Thr	Met	Leu	Met	Ala	Gly	Ala	Asn	Tyr	Asp	Met	Val	Leu
		515					520					525			
Ile	Lys	Phe	Ala	Thr	Phe	Phe	Glu	Lys	His	His	Gly	Phe	Asn	Val	Lys
	530					535					540				
Trp	Gln	Arg	Ile	Ile	Asp	Lys	Glu	Val	Lys	Pro	Ser	Thr	Gly	Leu	Ile
545					550					555					560
Gln	Pro	Thr	Asn	Ser	Leu	Phe	Lys	Ala	His	Ser	Ser	Leu	Val	Asn	Leu
				565					570					575	
Glu	Glu	Asn	Ser	Gln	Val	Thr	Gln	Val	Ser	Ile	Ser	Lys	Lys	Trp	Met

			580					585				590					
Lys	Ser	Ser	Val	Lys	Asn	Lys	Pro	Ser	Val	Met	Ala	Tyr	Gln	Lys	Ala		
		595					600					605					
Leu	Pro	Lys	Thr	Gly	Asp	Thr	Glu	Ser	Ser	Leu	Ser	Pro	Val	Leu	Val		
	610					615					620						
Val	Thr	Leu	Leu	Leu	Ala	Cys	Phe	Ser	Phe	Val	Thr	Lys	Lys	Asn	Gln		
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Lys	Ser																

<210> 76
 <211> 637
 <212> PRT
 <213> Streptococcus agalactiae

<400> 76

Met	Lys	Arg	Lys	Tyr	Phe	Ile	Leu	Asn	Thr	Val	Thr	Val	Leu	Thr	Leu		
1				5					10					15			
Ala	Ala	Ala	Met	Asn	Thr	Ser	Ser	Ile	Tyr	Ala	Asn	Ser	Thr	Glu	Thr		
			20					25					30				
Ser	Ala	Ser	Val	Val	Pro	Thr	Thr	Asn	Thr	Ile	Val	Gln	Thr	Asn	Asp		
		35					40					45					
Ser	Asn	Pro	Thr	Ala	Lys	Phe	Val	Ser	Glu	Ser	Gly	Gln	Ser	Val	Ile		
	50					55					60						
Gly	Gln	Val	Lys	Pro	Asp	Asn	Ser	Ala	Ala	Leu	Thr	Thr	Val	Asp	Thr		
65					70				75						80		
Pro	His	His	Ile	Ser	Ala	Pro	Asp	Ala	Leu	Lys	Thr	Thr	Gln	Ser	Ser		
			85					90						95			
Pro	Val	Val	Glu	Ser	Thr	Ser	Thr	Lys	Leu	Thr	Glu	Glu	Thr	Tyr	Lys		
			100					105						110			
Gln	Lys	Asp	Gly	Gln	Asp	Leu	Ala	Asn	Met	Val	Arg	Ser	Gly	Gln	Val		
		115					120					125					
Thr	Ser	Glu	Glu	Leu	Val	Asn	Met	Ala	Tyr	Asp	Ile	Ile	Ala	Lys	Glu		
	130					135					140						
Asn	Pro	Ser	Leu	Asn	Ala	Val	Ile	Thr	Thr	Arg	Arg	Gln	Glu	Ala	Ile		
145					150					155					160		
Glu	Glu	Ala	Arg	Lys	Leu	Lys	Asp	Thr	Asn	Gln	Pro	Phe	Leu	Gly	Val		
				165					170					175			
Pro	Leu	Leu	Val	Lys	Gly	Leu	Gly	His	Ser	Ile	Lys	Gly	Gly	Glu	Thr		
			180					185					190				
Asn	Asn	Gly	Leu	Ile	Tyr	Ala	Asp	Gly	Lys	Ile	Ser	Thr	Phe	Asp	Ser		
	195						200					205					
Ser	Tyr	Val	Lys	Lys	Tyr	Lys	Asp	Leu	Gly	Phe	Ile	Ile	Leu	Gly	Gln		
	210					215					220						
Thr	Asn	Phe	Pro	Glu	Tyr	Gly	Trp	Arg	Asn	Ile	Thr	Asp	Ser	Lys	Leu		
225					230					235					240		
Tyr	Gly	Leu	Thr	His	Asn	Pro	Trp	Asp	Leu	Ala	His	Asn	Ala	Gly	Gly		
				245					250					255			
Ser	Ser	Gly	Gly	Ser	Ala	Ala	Ala	Ile	Ala	Ser	Gly	Met	Thr	Pro	Ile		
		260						265					270				
Ala	Ser	Gly	Ser	Asp	Ala	Gly	Gly	Ser	Ile	Arg	Ile	Pro	Ser	Ser	Trp		
	275						280					285					
Thr	Gly	Leu	Val	Gly	Leu	Lys	Pro	Thr	Arg	Gly	Leu	Val	Ser	Asn	Glu		
	290					295					300						
Lys	Pro	Asp	Ser	Tyr	Ser	Thr	Ala	Val	His	Phe	Pro	Leu	Thr	Lys	Ser		

305					310					315					320
Ser	Arg	Asp	Ala	Glu	Thr	Leu	Leu	Thr	Tyr	Leu	Lys	Lys	Ser	Asp	Gln
				325					330					335	
Thr	Leu	Val	Ser	Val	Asn	Asp	Leu	Lys	Ser	Leu	Pro	Ile	Ala	Tyr	Thr
			340					345					350		
Leu	Lys	Ser	Pro	Met	Gly	Thr	Glu	Val	Ser	Gln	Asp	Ala	Lys	Asn	Ala
		355					360				365				
Ile	Met	Asp	Asn	Val	Thr	Phe	Leu	Arg	Lys	Gln	Gly	Phe	Lys	Val	Thr
	370					375					380				
Glu	Ile	Asp	Leu	Pro	Ile	Asp	Gly	Arg	Ala	Leu	Met	Arg	Asp	Tyr	Ser
385					390					395					400
Thr	Leu	Ala	Ile	Gly	Met	Gly	Gly	Ala	Phe	Ser	Thr	Ile	Glu	Lys	Asp
				405					410					415	
Leu	Lys	Lys	His	Gly	Phe	Thr	Lys	Glu	Asp	Val	Asp	Pro	Ile	Thr	Trp
			420					425					430		
Ala	Val	His	Val	Ile	Tyr	Gln	Asn	Ser	Asp	Lys	Ala	Glu	Leu	Lys	Lys
		435					440					445			
Ser	Ile	Met	Glu	Ala	Gln	Lys	His	Met	Asp	Asp	Tyr	Arg	Lys	Ala	Met
	450					455					460				
Glu	Lys	Leu	His	Lys	Gln	Phe	Pro	Ile	Phe	Leu	Ser	Pro	Thr	Thr	Ala
465					470					475					480
Ser	Leu	Ala	Pro	Leu	Asn	Thr	Asp	Pro	Tyr	Val	Thr	Glu	Glu	Asp	Lys
				485					490					495	
Arg	Ala	Ile	Tyr	Asn	Met	Glu	Asn	Leu	Ser	Gln	Glu	Glu	Arg	Ile	Ala
			500					505					510		
Leu	Phe	Asn	Arg	Gln	Trp	Glu	Pro	Met	Leu	Arg	Arg	Thr	Pro	Phe	Thr
		515					520					525			
Gln	Ile	Ala	Asn	Met	Thr	Gly	Leu	Pro	Ala	Ile	Ser	Ile	Pro	Thr	Tyr
	530					535					540				
Leu	Ser	Glu	Ser	Gly	Leu	Pro	Ile	Gly	Thr	Met	Leu	Met	Ala	Gly	Ala
545					550					555					560
Asn	Tyr	Asp	Met	Val	Leu	Ile	Lys	Phe	Ala	Thr	Phe	Phe	Glu	Lys	His
				565					570					575	
His	Gly	Phe	Asn	Val	Lys	Trp	Gln	Arg	Ile	Ile	Asp	Lys	Glu	Val	Lys
			580					585					590		
Pro	Ser	Thr	Gly	Leu	Ile	Gln	Pro	Thr	Asn	Ser	Leu	Phe	Lys	Ala	His
		595					600					605			
Ser	Ser	Leu	Val	Asn	Leu	Glu	Glu	Asn	Ser	Gln	Val	Thr	Gln	Val	Ser
	610					615					620				
Ile	Ser	Lys	Lys	Trp	Met	Lys	Ser	Ser	Val	Lys	Asn	Lys			
625					630					635					

<210> 77
 <211> 599
 <212> PRT
 <213> Streptococcus agalactiae

<400> 77
 Thr Thr Asn Thr Ile Val Gln Thr Asn Asp Ser Asn Pro Thr Ala Lys
 1 5 10 15
 Phe Val Ser Glu Ser Gly Gln Ser Val Ile Gly Gln Val Lys Pro Asp
 20 25 30
 Asn Ser Ala Ala Leu Thr Thr Val Asp Thr Pro His His Ile Ser Ala
 35 40 45
 Pro Asp Ala Leu Lys Thr Thr Gln Ser Ser Pro Val Val Glu Ser Thr

50		55		60	
Ser Thr Lys Leu Thr	Glu Glu Thr Tyr Lys	Gln Lys Asp Gly Gln Asp			
65	70	75	80		
Leu Ala Asn Met Val	Arg Ser Gly Gln Val Thr	Ser Glu Glu Leu Val			
	85	90	95		
Asn Met Ala Tyr Asp	Ile Ile Ala Lys Glu Asn Pro Ser	Leu Asn Ala			
	100	105	110		
Val Ile Thr Thr Arg	Arg Gln Glu Ala Ile Glu Glu Ala	Arg Lys Leu			
	115	120	125		
Lys Asp Thr Asn Gln	Pro Phe Leu Gly Val Pro Leu Leu Val	Lys Gly			
	130	135	140		
Leu Gly His Ser Ile	Lys Gly Gly Glu Thr Asn Asn Gly Leu Ile Tyr				
	145	150	155	160	
Ala Asp Gly Lys Ile	Ser Thr Phe Asp Ser Ser Tyr Val Lys Lys Tyr				
	165	170	175		
Lys Asp Leu Gly Phe	Ile Ile Leu Gly Gln Thr Asn Phe Pro Glu Tyr				
	180	185	190		
Gly Trp Arg Asn Ile	Thr Asp Ser Lys Leu Tyr Gly Leu Thr His Asn				
	195	200	205		
Pro Trp Asp Leu Ala	His Asn Ala Gly Gly Ser Ser Gly Gly Ser Ala				
	210	215	220		
Ala Ala Ile Ala Ser	Gly Met Thr Pro Ile Ala Ser Gly Ser Asp Ala				
	225	230	235	240	
Gly Gly Ser Ile Arg	Ile Pro Ser Ser Trp Thr Gly Leu Val Gly Leu				
	245	250	255		
Lys Pro Thr Arg Gly	Leu Val Ser Asn Glu Lys Pro Asp Ser Tyr Ser				
	260	265	270		
Thr Ala Val His Phe	Pro Leu Thr Lys Ser Ser Arg Asp Ala Glu Thr				
	275	280	285		
Leu Leu Thr Tyr Leu	Lys Lys Ser Asp Gln Thr Leu Val Ser Val Asn				
	290	295	300		
Asp Leu Lys Ser Leu	Pro Ile Ala Tyr Thr Leu Lys Ser Pro Met Gly				
	305	310	315	320	
Thr Glu Val Ser Gln	Asp Ala Lys Asn Ala Ile Met Asp Asn Val Thr				
	325	330	335		
Phe Leu Arg Lys Gln	Gly Phe Lys Val Thr Glu Ile Asp Leu Pro Ile				
	340	345	350		
Asp Gly Arg Ala Leu	Met Arg Asp Tyr Ser Thr Leu Ala Ile Gly Met				
	355	360	365		
Gly Gly Ala Phe Ser	Thr Ile Glu Lys Asp Leu Lys Lys His Gly Phe				
	370	375	380		
Thr Lys Glu Asp Val	Asp Pro Ile Thr Trp Ala Val His Val Ile Tyr				
	385	390	395	400	
Gln Asn Ser Asp Lys	Ala Glu Leu Lys Lys Ser Ile Met Glu Ala Gln				
	405	410	415		
Lys His Met Asp Asp	Tyr Arg Lys Ala Met Glu Lys Leu His Lys Gln				
	420	425	430		
Phe Pro Ile Phe Leu	Ser Pro Thr Ala Ser Leu Ala Pro Leu Asn				
	435	440	445		
Thr Asp Pro Tyr Val	Thr Glu Glu Asp Lys Arg Ala Ile Tyr Asn Met				
	450	455	460		
Glu Asn Leu Ser Gln	Glu Glu Arg Ile Ala Leu Phe Asn Arg Gln Trp				
	465	470	475	480	
Glu Pro Met Leu Arg	Arg Thr Pro Phe Thr Gln Ile Ala Asn Met Thr				
	485	490	495		

Gly Leu Pro Ala Ile Ser Ile Pro Thr Tyr Leu Ser Glu Ser Gly Leu
 500 505 510
 Pro Ile Gly Thr Met Leu Met Ala Gly Ala Asn Tyr Asp Met Val Leu
 515 520 525
 Ile Lys Phe Ala Thr Phe Phe Glu Lys His His Gly Phe Asn Val Lys
 530 535 540
 Trp Gln Arg Ile Ile Asp Lys Glu Val Lys Pro Ser Thr Gly Leu Ile
 545 550 555 560
 Gln Pro Thr Asn Ser Leu Phe Lys Ala His Ser Ser Leu Val Asn Leu
 565 570 575
 Glu Glu Asn Ser Gln Val Thr Gln Val Ser Ile Ser Lys Lys Trp Met
 580 585 590
 Lys Ser Ser Val Lys Asn Lys
 595

<210> 78
 <211> 1020
 <212> DNA
 <213> Streptococcus agalactiae

<400> 78
 atgaaacgta ttgctgtttt aactagtggt ggtgacgccc ctggtatgaa cgctgctatc 60
 cgtgcagttg ttcgtaaagc aatttctgaa ggtatggaag tttacggcat caaccaaggt 120
 tactatggta tggtagacagg ggatattttc cctttggatg ctaattctgt tggggatact 180
 atcaaccgtg gaggaacgtt tttacgttca gcacgttatc ctgaatttgc tgaacttgaa 240
 ggtcagctta aagggattga acagcttaaa aaacacggta ttgaagggtg agtagttatc 300
 ggtggtgatg gttcttatca tggtagctatg cgtctaactg agcacggttt cccagctggt 360
 ggtttgccgg gtacaattga taacgatatc gttggcactg actatactat tggttttgac 420
 acagcagttg cgacagcagt tgagaatctt gaccgtcttc gtgatacatc agcaagtcac 480
 aaccgtactt ttgttggtga ggttatggga agaaatgcag gagatatcgc tctttggtca 540
 ggtatcgctg caggtgcaga tcaaattatt gttcctgaag aagagttcaa tattgatgaa 600
 gttgtctcaa atgttagagc tggctatgca gctggtaaac atcaccaa atcatcgctcctt 660
 gcagaagggtg ttatgagtggt tgatgagttt gcaaaaacaa tgaaagcagc aggagacgat 720
 agcgatcttc gtgtgacgaa tttaggacat ctgctccgtg gtggtagtcc gacggctcgt 780
 gatcgtgtct tagcatctcg tatgggagcg tacgctgttc aattggtgaa agaaggctcg 840
 ggtggttttag ccgttggtgt ccacaacgaa gaaatggttg aaagtccaat tttagggtta 900
 gcagaagaag gtgctttggt cagcttgact gatgaaggaa aaatcgttgt taataatccg 960
 cataaagcgg accttcgctt ggcagcactt aatcgtagacc ttgccaacca aagtagtaaa 1020

<210> 79
 <211> 340
 <212> PRT
 <213> Streptococcus agalactiae

<400> 79
 Met Lys Arg Ile Ala Val Leu Thr Ser Gly Gly Asp Ala Pro Gly Met
 1 5 10 15
 Asn Ala Ala Ile Arg Ala Val Val Arg Lys Ala Ile Ser Glu Gly Met
 20 25 30
 Glu Val Tyr Gly Ile Asn Gln Gly Tyr Tyr Gly Met Val Thr Gly Asp
 35 40 45
 Ile Phe Pro Leu Asp Ala Asn Ser Val Gly Asp Thr Ile Asn Arg Gly
 50 55 60
 Gly Thr Phe Leu Arg Ser Ala Arg Tyr Pro Glu Phe Ala Glu Leu Glu
 65 70 75 80

Gly Gln Leu Lys Gly Ile Glu Gln Leu Lys Lys His Gly Ile Glu Gly
 85 90 95
 Val Val Val Ile Gly Gly Asp Gly Ser Tyr His Gly Ala Met Arg Leu
 100 105 110
 Thr Glu His Gly Phe Pro Ala Val Gly Leu Pro Gly Thr Ile Asp Asn
 115 120 125
 Asp Ile Val Gly Thr Asp Tyr Thr Ile Gly Phe Asp Thr Ala Val Ala
 130 135 140
 Thr Ala Val Glu Asn Leu Asp Arg Leu Arg Asp Thr Ser Ala Ser His
 145 150 155 160
 Asn Arg Thr Phe Val Val Glu Val Met Gly Arg Asn Ala Gly Asp Ile
 165 170 175
 Ala Leu Trp Ser Gly Ile Ala Ala Gly Ala Asp Gln Ile Ile Val Pro
 180 185 190
 Glu Glu Glu Phe Asn Ile Asp Glu Val Val Ser Asn Val Arg Ala Gly
 195 200 205
 Tyr Ala Ala Gly Lys His His Gln Ile Ile Val Leu Ala Glu Gly Val
 210 215 220
 Met Ser Gly Asp Glu Phe Ala Lys Thr Met Lys Ala Ala Gly Asp Asp
 225 230 235 240
 Ser Asp Leu Arg Val Thr Asn Leu Gly His Leu Leu Arg Gly Gly Ser
 245 250 255
 Pro Thr Ala Arg Asp Arg Val Leu Ala Ser Arg Met Gly Ala Tyr Ala
 260 265 270
 Val Gln Leu Leu Lys Glu Gly Arg Gly Gly Leu Ala Val Gly Val His
 275 280 285
 Asn Glu Glu Met Val Glu Ser Pro Ile Leu Gly Leu Ala Glu Glu Gly
 290 295 300
 Ala Leu Phe Ser Leu Thr Asp Glu Gly Lys Ile Val Val Asn Asn Pro
 305 310 315 320
 His Lys Ala Asp Leu Arg Leu Ala Ala Leu Asn Arg Asp Leu Ala Asn
 325 330 335
 Gln Ser Ser Lys
 340

<210> 80
 <211> 2070
 <212> DNA
 <213> Streptococcus agalactiae

<400> 80
 atgaaaaaga aaattatttt gaaaagtagt gttcttggtt tagtcgctgg gacttctatt 60
 atgttctcaa gcgtgttcgc ggaccaagtc ggtgtccaag ttataggcgt caatgacttt 120
 catggtgcac ttgacaatac tggaacagca aatatgcctg atggaaaagt tgctaattgct 180
 ggtactgctg ctcaattaga tgcttatatg gatgacgctc aaaaagattt caaacaaact 240
 aaccctaatt gtgaaagcat tagggttcaa gcaggcgata tggttggagc aagtccagcc 300
 aactctgggc ttcttcaaga tgaaccaact gtcaaaaatt ttaatgcaat gaatgttgag 360
 tatggcacat tgggtaacca tgaatttgat gaagggttgg cagaatataa tcgtatcggt 420
 actggtaaaag cccctgctcc agattctaatt attaataata ttacgaaatc ataccacat 480
 gaagctgcaa aacaagaaat tgtagtggca aatgttattg ataaagttaa caaacaatt 540
 ccttacaatt ggaagcctta cgctattaaa aatattcctg taaataacaa aagtgtgaac 600
 gttggcttta tcgggattgt caccaaagac atcccaaacc ttgtcttacg taaaaattat 660
 gaacaatatg aattttttaga tgaagctgaa acaatcgtta aatacgccaa agaattacaa 720
 gctaaaaatg tcaaagctat tgtagttctc gcacatgtac ctgcaacaag taaaaatgat 780
 attgctgaag gtgaagcagc agaaatgatg aaaaaagtca atcaactctt ccctgaaaat 840

agcgtagata	ttgtctttgc	tggaacacaat	catcaatata	caaatggtct	tgttggtaaa	900
actcgtattg	tacaagcgct	ctctcaagga	aaagcctatg	ctgatgtacg	tggtgtctta	960
gatactgata	cacaagattt	cattgagacc	ccttcagcta	aagtaattgc	agttgctcct	1020
ggtaaaaaaa	caggtagtgc	cgatattcaa	gccattgttg	accaagctaa	tactatcggt	1080
aaacaagtaa	cagaagctaa	aattggtact	gccgaggtaa	gtgtcatgat	tacgcgttct	1140
gttgatcaag	ataatgttag	tccggtaggc	agcctcatca	cagaggctca	actagcaatt	1200
gctcgaaaaa	gctggccaga	tatcgatttt	gccatgacaa	ataatggtgg	cattcgtgct	1260
gacttactca	tcaaaccaga	tggaacaatc	acctggggag	ctgcacaagc	agttcaacct	1320
tttggttaata	tcttacaagt	cgtcgaaatt	actggtagag	atctttataa	agcactcaac	1380
gaacaatacg	acaaaaaaca	aaattttctt	cttcaaatag	ctggtctgcg	atacacttac	1440
acagataata	aagagggcgg	ggaagaaaca	ccattttaaag	ttgtaaaagc	ttataaatca	1500
aatggtgagg	aaatcaatcc	tgatgcaaaa	tacaaattag	ttatcaatga	ctttttattc	1560
ggtggtggtg	atggcctttgc	aagcttcaga	aatgccaaac	ttctaggagc	cattaacccc	1620
gatacagagg	tatttatggc	ctatatcact	gatttagaaa	aagctggtaa	aaaagtgagc	1680
gttccaaata	ataaacctaa	aatctatgtc	actatgaaga	tggttaatga	aactattaca	1740
caaatgatg	gtacacatag	cattattaag	aaactttatt	tagatcgaca	aggaaatatt	1800
gtagcacaag	agattgtatc	agacacttta	aaccaaacaa	aatcaaaatc	tacaaaaatc	1860
aaccctgtaa	ctacaattca	caaaaaacaa	ttacaccaat	ttacagctat	taaccctatg	1920
agaaattatg	gcaaaccatc	aaactccact	actgtaaaat	caaaacaatt	acaaaaaaca	1980
aactctgaat	atggacaatc	attccttatg	tctgtctttg	gtgttggtgact	tataggaatt	2040
gctttaaata	caaagaaaaa	acatatgaaa				2070

<210> 81

<211> 690

<212> PRT

<213> Streptococcus agalactiae

<400> 81

Met	Lys	Lys	Lys	Ile	Ile	Leu	Lys	Ser	Ser	Val	Leu	Gly	Leu	Val	Ala
1				5				10						15	
Gly	Thr	Ser	Ile	Met	Phe	Ser	Ser	Val	Phe	Ala	Asp	Gln	Val	Gly	Val
			20					25					30		
Gln	Val	Ile	Gly	Val	Asn	Asp	Phe	His	Gly	Ala	Leu	Asp	Asn	Thr	Gly
		35					40					45			
Thr	Ala	Asn	Met	Pro	Asp	Gly	Lys	Val	Ala	Asn	Ala	Gly	Thr	Ala	Ala
	50				55						60				
Gln	Leu	Asp	Ala	Tyr	Met	Asp	Asp	Ala	Gln	Lys	Asp	Phe	Lys	Gln	Thr
65				70				75						80	
Asn	Pro	Asn	Gly	Glu	Ser	Ile	Arg	Val	Gln	Ala	Gly	Asp	Met	Val	Gly
			85					90						95	
Ala	Ser	Pro	Ala	Asn	Ser	Gly	Leu	Leu	Gln	Asp	Glu	Pro	Thr	Val	Lys
		100					105						110		
Asn	Phe	Asn	Ala	Met	Asn	Val	Glu	Tyr	Gly	Thr	Leu	Gly	Asn	His	Glu
	115					120					125				
Phe	Asp	Glu	Gly	Leu	Ala	Glu	Tyr	Asn	Arg	Ile	Val	Thr	Gly	Lys	Ala
	130			135						140					
Pro	Ala	Pro	Asp	Ser	Asn	Ile	Asn	Asn	Ile	Thr	Lys	Ser	Tyr	Pro	His
145				150					155					160	
Glu	Ala	Ala	Lys	Gln	Glu	Ile	Val	Val	Ala	Asn	Val	Ile	Asp	Lys	Val
			165				170						175		
Asn	Lys	Gln	Ile	Pro	Tyr	Asn	Trp	Lys	Pro	Tyr	Ala	Ile	Lys	Asn	Ile
		180					185					190			
Pro	Val	Asn	Asn	Lys	Ser	Val	Asn	Val	Gly	Phe	Ile	Gly	Ile	Val	Thr
	195					200					205				
Lys	Asp	Ile	Pro	Asn	Leu	Val	Leu	Arg	Lys	Asn	Tyr	Glu	Gln	Tyr	Glu

210	215	220
Phe Leu Asp Glu Ala Glu Thr Ile Val Lys Tyr Ala Lys Glu Leu Gln		
225	230	235
Ala Lys Asn Val Lys Ala Ile Val Val Leu Ala His Val Pro Ala Thr		
	245	250
Ser Lys Asn Asp Ile Ala Glu Gly Glu Ala Ala Glu Met Met Lys Lys		
	260	265
Val Asn Gln Leu Phe Pro Glu Asn Ser Val Asp Ile Val Phe Ala Gly		
	275	280
His Asn His Gln Tyr Thr Asn Gly Leu Val Gly Lys Thr Arg Ile Val		
	290	295
Gln Ala Leu Ser Gln Gly Lys Ala Tyr Ala Asp Val Arg Gly Val Leu		
305	310	315
Asp Thr Asp Thr Gln Asp Phe Ile Glu Thr Pro Ser Ala Lys Val Ile		
	325	330
Ala Val Ala Pro Gly Lys Lys Thr Gly Ser Ala Asp Ile Gln Ala Ile		
	340	345
Val Asp Gln Ala Asn Thr Ile Val Lys Gln Val Thr Glu Ala Lys Ile		
	355	360
Gly Thr Ala Glu Val Ser Val Met Ile Thr Arg Ser Val Asp Gln Asp		
	370	375
Asn Val Ser Pro Val Gly Ser Leu Ile Thr Glu Ala Gln Leu Ala Ile		
385	390	395
Ala Arg Lys Ser Trp Pro Asp Ile Asp Phe Ala Met Thr Asn Asn Gly		
	405	410
Gly Ile Arg Ala Asp Leu Leu Ile Lys Pro Asp Gly Thr Ile Thr Trp		
	420	425
Gly Ala Ala Gln Ala Val Gln Pro Phe Gly Asn Ile Leu Gln Val Val		
	435	440
Glu Ile Thr Gly Arg Asp Leu Tyr Lys Ala Leu Asn Glu Gln Tyr Asp		
	450	455
Gln Lys Gln Asn Phe Phe Leu Gln Ile Ala Gly Leu Arg Tyr Thr Tyr		
465	470	475
Thr Asp Asn Lys Glu Gly Gly Glu Glu Thr Pro Phe Lys Val Val Lys		
	485	490
Ala Tyr Lys Ser Asn Gly Glu Glu Ile Asn Pro Asp Ala Lys Tyr Lys		
	500	505
Leu Val Ile Asn Asp Phe Leu Phe Gly Gly Gly Asp Gly Phe Ala Ser		
515	520	525
Phe Arg Asn Ala Lys Leu Leu Gly Ala Ile Asn Pro Asp Thr Glu Val		
	530	535
Phe Met Ala Tyr Ile Thr Asp Leu Glu Lys Ala Gly Lys Lys Val Ser		
545	550	555
Val Pro Asn Asn Lys Pro Lys Ile Tyr Val Thr Met Lys Met Val Asn		
	565	570
Glu Thr Ile Thr Gln Asn Asp Gly Thr His Ser Ile Ile Lys Lys Leu		
	580	585
Tyr Leu Asp Arg Gln Gly Asn Ile Val Ala Gln Glu Ile Val Ser Asp		
	595	600
Thr Leu Asn Gln Thr Lys Ser Lys Ser Thr Lys Ile Asn Pro Val Thr		
	610	615
Thr Ile His Lys Lys Gln Leu His Gln Phe Thr Ala Ile Asn Pro Met		
625	630	635
Arg Asn Tyr Gly Lys Pro Ser Asn Ser Thr Thr Val Lys Ser Lys Gln		

				645					650					655			
Leu	Pro	Lys	Thr	Asn	Ser	Glu	Tyr	Gly	Gln	Ser	Phe	Leu	Met	Ser	Val		
			660					665					670				
Phe	Gly	Val	Gly	Leu	Ile	Gly	Ile	Ala	Leu	Asn	Thr	Lys	Lys	Lys	His		
		675				680						685					
Met	Lys																
	690																

<210> 82
 <211> 650
 <212> PRT
 <213> Streptococcus agalactiae

<400> 82

His	Gly	Ala	Leu	Asp	Asn	Thr	Gly	Thr	Ala	Asn	Met	Pro	Asp	Gly	Lys		
1				5					10					15			
Val	Ala	Asn	Ala	Gly	Thr	Ala	Ala	Gln	Leu	Asp	Ala	Tyr	Met	Asp	Asp		
		20						25					30				
Ala	Gln	Lys	Asp	Phe	Lys	Gln	Thr	Asn	Pro	Asn	Gly	Glu	Ser	Ile	Arg		
	35					40						45					
Val	Gln	Ala	Gly	Asp	Met	Val	Gly	Ala	Ser	Pro	Ala	Asn	Ser	Gly	Leu		
	50					55					60						
Leu	Gln	Asp	Glu	Pro	Thr	Val	Lys	Asn	Phe	Asn	Ala	Met	Asn	Val	Glu		
65					70				75						80		
Tyr	Gly	Thr	Leu	Gly	Asn	His	Glu	Phe	Asp	Glu	Gly	Leu	Ala	Glu	Tyr		
			85					90						95			
Asn	Arg	Ile	Val	Thr	Gly	Lys	Ala	Pro	Ala	Pro	Asp	Ser	Asn	Ile	Asn		
	100							105					110				
Asn	Ile	Thr	Lys	Ser	Tyr	Pro	His	Glu	Ala	Ala	Lys	Gln	Glu	Ile	Val		
	115					120						125					
Val	Ala	Asn	Val	Ile	Asp	Lys	Val	Asn	Lys	Gln	Ile	Pro	Tyr	Asn	Trp		
	130					135					140						
Lys	Pro	Tyr	Ala	Ile	Lys	Asn	Ile	Pro	Val	Asn	Asn	Lys	Ser	Val	Asn		
145					150					155					160		
Val	Gly	Phe	Ile	Gly	Ile	Val	Thr	Lys	Asp	Ile	Pro	Asn	Leu	Val	Leu		
			165						170					175			
Arg	Lys	Asn	Tyr	Glu	Gln	Tyr	Glu	Phe	Leu	Asp	Glu	Ala	Glu	Thr	Ile		
		180						185					190				
Val	Lys	Tyr	Ala	Lys	Glu	Leu	Gln	Ala	Lys	Asn	Val	Lys	Ala	Ile	Val		
	195					200						205					
Val	Leu	Ala	His	Val	Pro	Ala	Thr	Ser	Lys	Asn	Asp	Ile	Ala	Glu	Gly		
	210					215					220						
Glu	Ala	Ala	Glu	Met	Met	Lys	Lys	Val	Asn	Gln	Leu	Phe	Pro	Glu	Asn		
225					230					235					240		
Ser	Val	Asp	Ile	Val	Phe	Ala	Gly	His	Asn	His	Gln	Tyr	Thr	Asn	Gly		
		245						250						255			
Leu	Val	Gly	Lys	Thr	Arg	Ile	Val	Gln	Ala	Leu	Ser	Gln	Gly	Lys	Ala		
		260						265					270				
Tyr	Ala	Asp	Val	Arg	Gly	Val	Leu	Asp	Thr	Asp	Thr	Gln	Asp	Phe	Ile		
	275						280						285				
Glu	Thr	Pro	Ser	Ala	Lys	Val	Ile	Ala	Val	Ala	Pro	Gly	Lys	Lys	Thr		
	290					295					300						
Gly	Ser	Ala	Asp	Ile	Gln	Ala	Ile	Val	Asp	Gln	Ala	Asn	Thr	Ile	Val		
305					310					315					320		
Lys	Gln	Val	Thr	Glu	Ala	Lys	Ile	Gly	Thr	Ala	Glu	Val	Ser	Val	Met		

Ile	Thr	Arg	Ser	Val	Asp	Gln	Asp	Asn	Val	Ser	Pro	Val	Gly	Ser	Leu
			340					345					350		
Ile	Thr	Glu	Ala	Gln	Leu	Ala	Ile	Ala	Arg	Lys	Ser	Trp	Pro	Asp	Ile
		355					360					365			
Asp	Phe	Ala	Met	Thr	Asn	Asn	Gly	Gly	Ile	Arg	Ala	Asp	Leu	Leu	Ile
	370				375					380					
Lys	Pro	Asp	Gly	Thr	Ile	Thr	Trp	Gly	Ala	Ala	Gln	Ala	Val	Gln	Pro
385					390				395						400
Phe	Gly	Asn	Ile	Leu	Gln	Val	Val	Glu	Ile	Thr	Gly	Arg	Asp	Leu	Tyr
			405					410					415		
Lys	Ala	Leu	Asn	Glu	Gln	Tyr	Asp	Gln	Lys	Gln	Asn	Phe	Phe	Leu	Gln
			420					425					430		
Ile	Ala	Gly	Leu	Arg	Tyr	Thr	Tyr	Thr	Asp	Asn	Lys	Glu	Gly	Gly	Glu
		435					440					445			
Glu	Thr	Pro	Phe	Lys	Val	Val	Lys	Ala	Tyr	Lys	Ser	Asn	Gly	Glu	Glu
	450					455					460				
Ile	Asn	Pro	Asp	Ala	Lys	Tyr	Lys	Leu	Val	Ile	Asn	Asp	Phe	Leu	Phe
465					470					475					480
Gly	Gly	Gly	Asp	Gly	Phe	Ala	Ser	Phe	Arg	Asn	Ala	Lys	Leu	Leu	Gly
			485					490					495		
Ala	Ile	Asn	Pro	Asp	Thr	Glu	Val	Phe	Met	Ala	Tyr	Ile	Thr	Asp	Leu
			500					505					510		
Glu	Lys	Ala	Gly	Lys	Lys	Val	Ser	Val	Pro	Asn	Asn	Lys	Pro	Lys	Ile
	515						520					525			
Tyr	Val	Thr	Met	Lys	Met	Val	Asn	Glu	Thr	Ile	Thr	Gln	Asn	Asp	Gly
	530				535						540				
Thr	His	Ser	Ile	Ile	Lys	Lys	Leu	Tyr	Leu	Asp	Arg	Gln	Gly	Asn	Ile
545					550					555					560
Val	Ala	Gln	Glu	Ile	Val	Ser	Asp	Thr	Leu	Asn	Gln	Thr	Lys	Ser	Lys
			565					570					575		
Ser	Thr	Lys	Ile	Asn	Pro	Val	Thr	Thr	Ile	His	Lys	Lys	Gln	Leu	His
			580					585					590		
Gln	Phe	Thr	Ala	Ile	Asn	Pro	Met	Arg	Asn	Tyr	Gly	Lys	Pro	Ser	Asn
		595					600					605			
Ser	Thr	Thr	Val	Lys	Ser	Lys	Gln	Leu	Pro	Lys	Thr	Asn	Ser	Glu	Tyr
	610					615					620				
Gly	Gln	Ser	Phe	Leu	Met	Ser	Val	Phe	Gly	Val	Gly	Leu	Ile	Gly	Ile
625					630				635						640
Ala	Leu	Asn	Thr	Lys	Lys	Lys	His	Met	Lys						
			645					650							

<210> 83
 <211> 654
 <212> PRT
 <213> Streptococcus agalactiae

<400> 83
 Met Lys Lys Lys Ile Ile Leu Lys Ser Ser Val Leu Gly Leu Val Ala
 1 5 10 15
 Gly Thr Ser Ile Met Phe Ser Ser Val Phe Ala Asp Gln Val Gly Val
 20 25 30
 Gln Val Ile Gly Val Asn Asp Phe His Gly Ala Leu Asp Asn Thr Gly
 35 40 45
 Thr Ala Asn Met Pro Asp Gly Lys Val Ala Asn Ala Gly Thr Ala Ala

Ala	Tyr	Lys	Ser	Asn	Gly	Glu	Glu	Ile	Asn	Pro	Asp	Ala	Lys	Tyr	Lys		
			500					505					510				
Leu	Val	Ile	Asn	Asp	Phe	Leu	Phe	Gly	Gly	Gly	Asp	Gly	Phe	Ala	Ser		
		515					520					525					
Phe	Arg	Asn	Ala	Lys	Leu	Leu	Gly	Ala	Ile	Asn	Pro	Asp	Thr	Glu	Val		
	530				535						540						
Phe	Met	Ala	Tyr	Ile	Thr	Asp	Leu	Glu	Lys	Ala	Gly	Lys	Lys	Val	Ser		
545					550					555					560		
Val	Pro	Asn	Asn	Lys	Pro	Lys	Ile	Tyr	Val	Thr	Met	Lys	Met	Val	Asn		
			565					570						575			
Glu	Thr	Ile	Thr	Gln	Asn	Asp	Gly	Thr	His	Ser	Ile	Ile	Lys	Lys	Leu		
		580						585					590				
Tyr	Leu	Asp	Arg	Gln	Gly	Asn	Ile	Val	Ala	Gln	Glu	Ile	Val	Ser	Asp		
	595				600						605						
Thr	Leu	Asn	Gln	Thr	Lys	Ser	Lys	Ser	Thr	Lys	Ile	Asn	Pro	Val	Thr		
	610				615						620						
Thr	Ile	His	Lys	Lys	Gln	Leu	His	Gln	Phe	Thr	Ala	Ile	Asn	Pro	Met		
625					630					635					640		
Arg	Asn	Tyr	Gly	Lys	Pro	Ser	Asn	Ser	Thr	Thr	Val	Lys	Ser				
			645					650									

<210> 84
 <211> 614
 <212> PRT
 <213> Streptococcus agalactiae

<400> 84

His	Gly	Ala	Leu	Asp	Asn	Thr	Gly	Thr	Ala	Asn	Met	Pro	Asp	Gly	Lys		
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Val	Ala	Asn	Ala	Gly	Thr	Ala	Ala	Gln	Leu	Asp	Ala	Tyr	Met	Asp	Asp		
		20						25					30				
Ala	Gln	Lys	Asp	Phe	Lys	Gln	Thr	Asn	Pro	Asn	Gly	Glu	Ser	Ile	Arg		
	35					40					45						
Val	Gln	Ala	Gly	Asp	Met	Val	Gly	Ala	Ser	Pro	Ala	Asn	Ser	Gly	Leu		
	50				55					60							
Leu	Gln	Asp	Glu	Pro	Thr	Val	Lys	Asn	Phe	Asn	Ala	Met	Asn	Val	Glu		
65					70				75						80		
Tyr	Gly	Thr	Leu	Gly	Asn	His	Glu	Phe	Asp	Glu	Gly	Leu	Ala	Glu	Tyr		
		85						90					95				
Asn	Arg	Ile	Val	Thr	Gly	Lys	Ala	Pro	Ala	Pro	Asp	Ser	Asn	Ile	Asn		
	100							105					110				
Asn	Ile	Thr	Lys	Ser	Tyr	Pro	His	Glu	Ala	Ala	Lys	Gln	Glu	Ile	Val		
	115						120						125				
Val	Ala	Asn	Val	Ile	Asp	Lys	Val	Asn	Lys	Gln	Ile	Pro	Tyr	Asn	Trp		
	130					135					140						
Lys	Pro	Tyr	Ala	Ile	Lys	Asn	Ile	Pro	Val	Asn	Asn	Lys	Ser	Val	Asn		
145					150					155					160		
Val	Gly	Phe	Ile	Gly	Ile	Val	Thr	Lys	Asp	Ile	Pro	Asn	Leu	Val	Leu		
		165						170					175				
Arg	Lys	Asn	Tyr	Glu	Gln	Tyr	Glu	Phe	Leu	Asp	Glu	Ala	Glu	Thr	Ile		
		180						185					190				
Val	Lys	Tyr	Ala	Lys	Glu	Leu	Gln	Ala	Lys	Asn	Val	Lys	Ala	Ile	Val		
	195						200					205					
Val	Leu	Ala	His	Val	Pro	Ala	Thr	Ser	Lys	Asn	Asp	Ile	Ala	Glu	Gly		
	210					215					220						

Glu	Ala	Ala	Glu	Met	Met	Lys	Lys	Val	Asn	Gln	Leu	Phe	Pro	Glu	Asn	225				230			235				240
Ser	Val	Asp	Ile	Val	Phe	Ala	Gly	His	Asn	His	Gln	Tyr	Thr	Asn	Gly				245			250				255	
Leu	Val	Gly	Lys	Thr	Arg	Ile	Val	Gln	Ala	Leu	Ser	Gln	Gly	Lys	Ala				260			265				270	
Tyr	Ala	Asp	Val	Arg	Gly	Val	Leu	Asp	Thr	Asp	Thr	Gln	Asp	Phe	Ile				275			280				285	
Glu	Thr	Pro	Ser	Ala	Lys	Val	Ile	Ala	Val	Ala	Pro	Gly	Lys	Lys	Thr				290			295			300		
Gly	Ser	Ala	Asp	Ile	Gln	Ala	Ile	Val	Asp	Gln	Ala	Asn	Thr	Ile	Val				305			310				320	
Lys	Gln	Val	Thr	Glu	Ala	Lys	Ile	Gly	Thr	Ala	Glu	Val	Ser	Val	Met					325		330				335	
Ile	Thr	Arg	Ser	Val	Asp	Gln	Asp	Asn	Val	Ser	Pro	Val	Gly	Ser	Leu					340		345				350	
Ile	Thr	Glu	Ala	Gln	Leu	Ala	Ile	Ala	Arg	Lys	Ser	Trp	Pro	Asp	Ile					355				365			
Asp	Phe	Ala	Met	Thr	Asn	Asn	Gly	Gly	Ile	Arg	Ala	Asp	Leu	Leu	Ile					370		375			380		
Lys	Pro	Asp	Gly	Thr	Ile	Thr	Trp	Gly	Ala	Ala	Gln	Ala	Val	Gln	Pro					385				395		400	
Phe	Gly	Asn	Ile	Leu	Gln	Val	Val	Glu	Ile	Thr	Gly	Arg	Asp	Leu	Tyr					405		410				415	
Lys	Ala	Leu	Asn	Glu	Gln	Tyr	Asp	Gln	Lys	Gln	Asn	Phe	Phe	Leu	Gln					420		425				430	
Ile	Ala	Gly	Leu	Arg	Tyr	Thr	Tyr	Thr	Asp	Asn	Lys	Glu	Gly	Gly	Glu					435		440				445	
Glu	Thr	Pro	Phe	Lys	Val	Val	Lys	Ala	Tyr	Lys	Ser	Asn	Gly	Glu	Glu					450				460			
Ile	Asn	Pro	Asp	Ala	Lys	Tyr	Lys	Leu	Val	Ile	Asn	Asp	Phe	Leu	Phe					465				475		480	
Gly	Gly	Gly	Asp	Gly	Phe	Ala	Ser	Phe	Arg	Asn	Ala	Lys	Leu	Leu	Gly					485		490				495	
Ala	Ile	Asn	Pro	Asp	Thr	Glu	Val	Phe	Met	Ala	Tyr	Ile	Thr	Asp	Leu					500		505				510	
Glu	Lys	Ala	Gly	Lys	Lys	Val	Ser	Val	Pro	Asn	Asn	Lys	Pro	Lys	Ile					515		520				525	
Tyr	Val	Thr	Met	Lys	Met	Val	Asn	Glu	Thr	Ile	Thr	Gln	Asn	Asp	Gly					530		535				540	
Thr	His	Ser	Ile	Ile	Lys	Lys	Leu	Tyr	Leu	Asp	Arg	Gln	Gly	Asn	Ile					545				555		560	
Val	Ala	Gln	Glu	Ile	Val	Ser	Asp	Thr	Leu	Asn	Gln	Thr	Lys	Ser	Lys					565		570				575	
Ser	Thr	Lys	Ile	Asn	Pro	Val	Thr	Thr	Ile	His	Lys	Lys	Gln	Leu	His					580		585				590	
Gln	Phe	Thr	Ala	Ile	Asn	Pro	Met	Arg	Asn	Tyr	Gly	Lys	Pro	Ser	Asn					595		600				605	
Ser	Thr	Thr	Val	Lys	Ser															610							

<210> 85

<211> 783

<212> DNA

<213> Streptococcus agalactiae

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<400> 85
atgaaaagat tacataaact gtttataacc gtaattgcta cattaggtat gttgggggta      60
atgacctttg gtcttccaac gcagccgcaa aacgtaacgc cgatagtaca tgctgatgtc      120
aattcatctg ttgatacgag ccaggaattht caaaataatt taaaaaatgc tattggtaac      180
ctaccatttc aatatgttaa tgggtatttt gaattaaata ataatcagac aaattttaa      240
gctgatgtca atgttaaagc gtatgttcaa aatacaattg acaatcaaca aagactatca      300
actgctaatt caatgcttga tagaaccatt cgtcaatatc aaaatcgcag agataccact      360
cttcccgatg caaattggaa accattaggt tggcatcaag tagctactaa tgaccattat      420
ggacatgcag tcgacaaggg gcattttaatt gcctatgctt tagctggaaa tttcaaaggt      480
tgggatgctt ccgtgtcaaa tcctcaaaat gttgtcacac aaacagctca ttccaaccaa      540
tcaaatacaa aaatcaatcg tggacaaaat tattatgaaa gcttagttcg taaggcgggt      600
gacaaaaaca aacgtgttcg ttaccgtgta actccattgt accgtaatga tactgattta      660
gttccatttg caatgcacct agaagctaaa tcacaagatg gcacattaga atttaattgt      720
gctattccaa acacacaagc atcatatact atggattatg caacaggaga aataacacta      780
aat                                                                    783

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<210> 86
<211> 261
<212> PRT
<213> Streptococcus agalactiae

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<400> 86
Met Lys Arg Leu His Lys Leu Phe Ile Thr Val Ile Ala Thr Leu Gly
 1          5          10          15
Met Leu Gly Val Met Thr Phe Gly Leu Pro Thr Gln Pro Gln Asn Val
 20          25          30
Thr Pro Ile Val His Ala Asp Val Asn Ser Ser Val Asp Thr Ser Gln
 35          40          45
Glu Phe Gln Asn Asn Leu Lys Asn Ala Ile Gly Asn Leu Pro Phe Gln
 50          55          60
Tyr Val Asn Gly Ile Tyr Glu Leu Asn Asn Asn Gln Thr Asn Leu Asn
 65          70          75          80
Ala Asp Val Asn Val Lys Ala Tyr Val Gln Asn Thr Ile Asp Asn Gln
          85          90          95
Gln Arg Leu Ser Thr Ala Asn Ala Met Leu Asp Arg Thr Ile Arg Gln
 100          105          110
Tyr Gln Asn Arg Arg Asp Thr Thr Leu Pro Asp Ala Asn Trp Lys Pro
 115          120          125
Leu Gly Trp His Gln Val Ala Thr Asn Asp His Tyr Gly His Ala Val
 130          135          140
Asp Lys Gly His Leu Ile Ala Tyr Ala Leu Ala Gly Asn Phe Lys Gly
 145          150          155          160
Trp Asp Ala Ser Val Ser Asn Pro Gln Asn Val Val Thr Gln Thr Ala
          165          170          175
His Ser Asn Gln Ser Asn Gln Lys Ile Asn Arg Gly Gln Asn Tyr Tyr
          180          185          190
Glu Ser Leu Val Arg Lys Ala Val Asp Gln Asn Lys Arg Val Arg Tyr
          195          200          205
Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala
          210          215          220
Met His Leu Glu Ala Lys Ser Gln Asp Gly Thr Leu Glu Phe Asn Val
          225          230          235          240
Ala Ile Pro Asn Thr Gln Ala Ser Tyr Thr Met Asp Tyr Ala Thr Gly
          245          250          255

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Glu Ile Thr Leu Asn
260

<210> 87
<211> 2703
<212> DNA
<213> Streptococcus agalactiae

<400> 87
atgagaaaaat accaaaaaatt ttctaaaata ttgacgttaa gtctttttttg tttgtcgcaa 60
ataccgctta ataccaatgt ttttaggggaa agtaccgtac cggaaaaatgg tgctaaagga 120
aagtttagttg ttaaaaagac agatgaccag aacaaaccac tttcaaaagc tacctttggt 180
ttaaaaacta ctgctcatcc agaaagtaaa atagaaaaag taactgctga gctaacagggt 240
gaagctactt ttgataatct catacctgga gattatactt tatcagaaga aacagcgccc 300
gaaggttata aaaagactaa ccagacttgg caagttaagg ttgagagtaa tggaaaaact 360
acgatacaaa atagtgggtga taaaaattcc acaattggac aaaatcagga agaactagat 420
aagcagtatc cccccacagg aatttatgaa gatacaaagg aatcttataa acttgagcat 480
gttaaagggtt cagttccaaa tggaaagtca gaggcaaaag cagttaaccc atattcaagt 540
gaagggtgagc atataagaga aattccagag ggaacattat ctaaacgtat ttcagaagta 600
ggtgatttag ctcataataa atataaaatt gagttaactg tcagtggaaa aaccatagta 660
aaaccagtgg acaaacaaaa gccgttagat gttgtcttcg tactcgataa ttctaactca 720
atgaataacg atggcccaaa ttttcaaagg cataataaag ccaagaaagc tgccgaagct 780
cttgggaccg cagtaaaaga tatttttagga gcaaacagtg ataatagggt tgcattagtt 840
acctatgggt cagatatttt tgatggtagg agtgtagatg tcgtaaaagg atttaaagaa 900
gatgataaat attatggcct tcaaactaag ttcacaattc agacagagaa ttatagtcac 960
aaacaattaa caaataatgc tgaagagatt ataaaaagga ttccgacaga agctcctaaa 1020
gctaagtggg gatctactac caatggatta actccagagc aacaaaagga gtactatctt 1080
agtaaagtag gagaaacatt tactatgaaa gccttcatgg aggcagatga tattttgagt 1140
caagtaaate gaaatagtca aaaaattatt gttcatgtaa ctgatgggtg tcctacgaga 1200
tcatatgcta ttaataattt taaactgggt gcatcatatg aaagccaatt tgaacaaatg 1260
aaaaaaaatg gatatactaaa taaaagtaat tttctactta ctgataagcc cgaggatata 1320
aaaggaaatg gggagagtta ctttttggtt cccttagata gttatcaaac acagataatc 1380
tctggaaact tacaaaaact tcattatttt gatttaaatc ttaattacc taaagggtaca 1440
atztatcgaa atggaccagt gaaagaacat ggaacaccaa ccaaacttta tataaatagt 1500
ttaaaacaga aaaattatga cattttttaa tttgggtatcg atatatctgg ttttagacaa 1560
gtttataatg aggagtataa gaaaaatcaa gatgggtactt ttcaaaaatt gaaagaggaa 1620
gcttttaaac tttcagatgg agaaatcaca gaactaatga ggtcgtttct ttcctaacct 1680
gagtactaca cccctatcgt aacttcagcc gatacatcta acaatgaaat tttatctaaa 1740
attcagcaac aatttgaaac gattttaaca aaagaaaact caattgttaa tggaactatc 1800
gaagatccta tgggtgataa aatcaattta cagcttggtg atggacaaac attacagcca 1860
agtgattata ctttacaggg aatgatgga agtgtaatga aggatgggtat tgcaactggt 1920
gggcctaata atgatgggtg aatacttaag ggggttaaat tagaatacat cggaaataaa 1980
ctctatgtta gaggtttgaa tttaggagaa ggtcaaaaag taacactcac atatgatgtg 2040
aaactagatg acagttttat aagtaacaaa ttctatgaca ctaatggtag aacaacattg 2100
aatcctaagt cagaggatcc taatacactt agagattttc caatccctaa aattcgtgat 2160
gtgagagaat atcctacaat aacgattaaa aacgagaaga agttagggtg aattgaattt 2220
ataaaagttg ataaagataa taataagttg ctctctcaaag gagctacgtt tgaacttcaa 2280
gaatttaattg aagttataa acttttatta ccaataaaaa ataataattc aaaagtagtg 2340
acgggagaaa acggcaaaa ttcttacaaa gatttgaaag atggcaaata tcagttataa 2400
gaagcagttt cgccggagga ttatcaaaaa attactaata aaccaatttt aacttttgaa 2460
gtgggttaaag gatcgataaa aaatataata gctgttaata aacagatttc tgaatatcat 2520
gaggaagggtg acaagcattt aattaccaac acgcatattc caccaaaagg aattattcct 2580
atgacagggtg ggaaaggaa tctatctttc atttttaatg gtggagctat gatgtctatt 2640
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gat 2703

<210> 88
 <211> 901
 <212> PRT
 <213> Streptococcus agalactiae

<400> 88
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 20 25 30
 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45
 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60
 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160
 Val Lys Gly Ser Val Pro Asn Gly Lys Ser Glu Ala Lys Ala Val Asn
 165 170 175
 Pro Tyr Ser Ser Glu Gly Glu His Ile Arg Glu Ile Pro Glu Gly Thr
 180 185 190
 Leu Ser Lys Arg Ile Ser Glu Val Gly Asp Leu Ala His Asn Lys Tyr
 195 200 205
 Lys Ile Glu Leu Thr Val Ser Gly Lys Thr Ile Val Lys Pro Val Asp
 210 215 220
 Lys Gln Lys Pro Leu Asp Val Val Phe Val Leu Asp Asn Ser Asn Ser
 225 230 235 240
 Met Asn Asn Asp Gly Pro Asn Phe Gln Arg His Asn Lys Ala Lys Lys
 245 250 255
 Ala Ala Glu Ala Leu Gly Thr Ala Val Lys Asp Ile Leu Gly Ala Asn
 260 265 270
 Ser Asp Asn Arg Val Ala Leu Val Thr Tyr Gly Ser Asp Ile Phe Asp
 275 280 285
 Gly Arg Ser Val Asp Val Val Lys Gly Phe Lys Glu Asp Asp Lys Tyr
 290 295 300
 Tyr Gly Leu Gln Thr Lys Phe Thr Ile Gln Thr Glu Asn Tyr Ser His
 305 310 315 320
 Lys Gln Leu Thr Asn Asn Ala Glu Glu Ile Ile Lys Arg Ile Pro Thr
 325 330 335
 Glu Ala Pro Lys Ala Lys Trp Gly Ser Thr Thr Asn Gly Leu Thr Pro
 340 345 350

 Glu Gln Gln Lys Glu Tyr Tyr Leu Ser Lys Val Gly Glu Thr Phe Thr
 355 360 365
 Met Lys Ala Phe Met Glu Ala Asp Asp Ile Leu Ser Gln Val Asn Arg

370	375	380
Asn Ser Gln Lys Ile Ile Val His Val Thr Asp Gly Val Pro Thr Arg		
385	390	395
Ser Tyr Ala Ile Asn Asn Phe Lys Leu Gly Ala Ser Tyr Glu Ser Gln		
	405	410
Phe Glu Gln Met Lys Lys Asn Gly Tyr Leu Asn Lys Ser Asn Phe Leu		
	420	425
Leu Thr Asp Lys Pro Glu Asp Ile Lys Gly Asn Gly Glu Ser Tyr Phe		
	435	440
Leu Phe Pro Leu Asp Ser Tyr Gln Thr Gln Ile Ile Ser Gly Asn Leu		
	450	455
Gln Lys Leu His Tyr Leu Asp Leu Asn Leu Asn Tyr Pro Lys Gly Thr		
465	470	475
Ile Tyr Arg Asn Gly Pro Val Lys Glu His Gly Thr Pro Thr Lys Leu		
	485	490
Tyr Ile Asn Ser Leu Lys Gln Lys Asn Tyr Asp Ile Phe Asn Phe Gly		
	500	505
Ile Asp Ile Ser Gly Phe Arg Gln Val Tyr Asn Glu Glu Tyr Lys Lys		
	515	520
Asn Gln Asp Gly Thr Phe Gln Lys Leu Lys Glu Glu Ala Phe Lys Leu		
	530	535
Ser Asp Gly Glu Ile Thr Glu Leu Met Arg Ser Phe Ser Ser Lys Pro		
545	550	555
Glu Tyr Tyr Thr Pro Ile Val Thr Ser Ala Asp Thr Ser Asn Asn Glu		
	565	570
Ile Leu Ser Lys Ile Gln Gln Gln Phe Glu Thr Ile Leu Thr Lys Glu		
	580	585
Asn Ser Ile Val Asn Gly Thr Ile Glu Asp Pro Met Gly Asp Lys Ile		
	595	600
Asn Leu Gln Leu Gly Asn Gly Gln Thr Leu Gln Pro Ser Asp Tyr Thr		
	610	615
Leu Gln Gly Asn Asp Gly Ser Val Met Lys Asp Gly Ile Ala Thr Gly		
625	630	635
Gly Pro Asn Asn Asp Gly Gly Ile Leu Lys Gly Val Lys Leu Glu Tyr		
	645	650
Ile Gly Asn Lys Leu Tyr Val Arg Gly Leu Asn Leu Gly Glu Gly Gln		
	660	665
Lys Val Thr Leu Thr Tyr Asp Val Lys Leu Asp Asp Ser Phe Ile Ser		
	675	680
Asn Lys Phe Tyr Asp Thr Asn Gly Arg Thr Thr Leu Asn Pro Lys Ser		
	690	695
Glu Asp Pro Asn Thr Leu Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp		
705	710	715
Val Arg Glu Tyr Pro Thr Ile Thr Ile Lys Asn Glu Lys Lys Leu Gly		
	725	730
Glu Ile Glu Phe Ile Lys Val Asp Lys Asp Asn Asn Lys Leu Leu Leu		
	740	745
Lys Gly Ala Thr Phe Glu Leu Gln Glu Phe Asn Glu Asp Tyr Lys Leu		
	755	760
Tyr Leu Pro Ile Lys Asn Asn Asn Ser Lys Val Val Thr Gly Glu Asn		
	770	775
Gly Lys Ile Ser Tyr Lys Asp Leu Lys Asp Gly Lys Tyr Gln Leu Ile		
785	790	795
Glu Ala Val Ser Pro Glu Asp Tyr Gln Lys Ile Thr Asn Lys Pro Ile		
	805	810
		815

Leu Thr Phe Glu Val Val Lys Gly Ser Ile Lys Asn Ile Ile Ala Val
 820 825 830
 Asn Lys Gln Ile Ser Glu Tyr His Glu Glu Gly Asp Lys His Leu Ile
 835 840 845
 Thr Asn Thr His Ile Pro Pro Lys Gly Ile Ile Pro Met Thr Gly Gly
 850 855 860
 Lys Gly Ile Leu Ser Phe Ile Leu Ile Gly Gly Ala Met Met Ser Ile
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 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
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 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
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 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160
 Val Lys Gly Ser Val Pro Asn Gly Lys Ser Glu Ala Lys Ala Val Asn
 165 170 175
 Pro Tyr Ser Ser Glu Gly Glu His Ile Arg Glu Ile Pro Glu Gly Thr
 180 185 190
 Leu Ser Lys Arg Ile Ser Glu Val Gly Asp Leu Ala His Asn Lys Tyr
 195 200 205
 Lys Ile Glu Leu Thr Val Ser Gly Lys Thr Ile Val Lys Pro Val Asp
 210 215 220
 Lys Gln Lys Pro Leu Asp Val Val Phe Val Leu Asp Asn Ser Asn Ser
 225 230 235 240
 Met Asn Asn Asp Gly Pro Asn Phe Gln Arg His Asn Lys Ala Lys Lys
 245 250 255
 Ala Ala Glu Ala Leu Gly Thr Ala Val Lys Asp Ile Leu Gly Ala Asn
 260 265 270
 Ser Asp Asn Arg Val Ala Leu Val Thr Tyr Gly Ser Asp Ile Phe Asp
 275 280 285

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Tyr	Gly	Leu	Gln	Thr	Lys	Phe	Thr	Ile	Gln	Thr	Glu	Asn	Tyr	Ser	His
305					310					315					320
Lys	Gln	Leu	Thr	Asn	Asn	Ala	Glu	Glu	Ile	Ile	Lys	Arg	Ile	Pro	Thr
				325					330					335	
Glu	Ala	Pro	Lys	Ala	Lys	Trp	Gly	Ser	Thr	Thr	Asn	Gly	Leu	Thr	Pro
			340					345					350		
Glu	Gln	Gln	Lys	Glu	Tyr	Tyr	Leu	Ser	Lys	Val	Gly	Glu	Thr	Phe	Thr
		355					360					365			
Met	Lys	Ala	Phe	Met	Glu	Ala	Asp	Asp	Ile	Leu	Ser	Gln	Val	Asn	Arg
370						375					380				
Asn	Ser	Gln	Lys	Ile	Ile	Val	His	Val	Thr	Asp	Gly	Val	Pro	Thr	Arg
385					390					395					400
Ser	Tyr	Ala	Ile	Asn	Asn	Phe	Lys	Leu	Gly	Ala	Ser	Tyr	Glu	Ser	Gln
				405					410						415
Phe	Glu	Gln	Met	Lys	Lys	Asn	Gly	Tyr	Leu	Asn	Lys	Ser	Asn	Phe	Leu
			420					425						430	
Leu	Thr	Asp	Lys	Pro	Glu	Asp	Ile	Lys	Gly	Asn	Gly	Glu	Ser	Tyr	Phe
		435					440					445			
Leu	Phe	Pro	Leu	Asp	Ser	Tyr	Gln	Thr	Gln	Ile	Ile	Ser	Gly	Asn	Leu
						455					460				
Gln	Lys	Leu	His	Tyr	Leu	Asp	Leu	Asn	Leu	Asn	Tyr	Pro	Lys	Gly	Thr
465					470					475					480
Ile	Tyr	Arg	Asn	Gly	Pro	Val	Lys	Glu	His	Gly	Thr	Pro	Thr	Lys	Leu
				485					490						495
Tyr	Ile	Asn	Ser	Leu	Lys	Gln	Lys	Asn	Tyr	Asp	Ile	Phe	Asn	Phe	Gly
			500					505					510		
Ile	Asp	Ile	Ser	Gly	Phe	Arg	Gln	Val	Tyr	Asn	Glu	Glu	Tyr	Lys	Lys
		515					520					525			
Asn	Gln	Asp	Gly	Thr	Phe	Gln	Lys	Leu	Lys	Glu	Glu	Ala	Phe	Lys	Leu
						535					540				
Ser	Asp	Gly	Glu	Ile	Thr	Glu	Leu	Met	Arg	Ser	Phe	Ser	Ser	Lys	Pro
545					550					555					560
Glu	Tyr	Tyr	Thr	Pro	Ile	Val	Thr	Ser	Ala	Asp	Thr	Ser	Asn	Asn	Glu
				565					570					575	
Ile	Leu	Ser	Lys	Ile	Gln	Gln	Gln	Phe	Glu	Thr	Ile	Leu	Thr	Lys	Glu
			580					585					590		
Asn	Ser	Ile	Val	Asn	Gly	Thr	Ile	Glu	Asp	Pro	Met	Gly	Asp	Lys	Ile
			595				600					605			
Asn	Leu	Gln	Leu	Gly	Asn	Gly	Gln	Thr	Leu	Gln	Pro	Ser	Asp	Tyr	Thr
						615					620				
Leu	Gln	Gly	Asn	Asp	Gly	Ser	Val	Met	Lys	Asp	Gly	Ile	Ala	Thr	Gly
625					630					635					640
Gly	Pro	Asn	Asn	Asp	Gly	Gly	Ile	Leu	Lys	Gly	Val	Lys	Leu	Glu	Tyr
				645					650					655	
Ile	Gly	Asn	Lys	Leu	Tyr	Val	Arg	Gly	Leu	Asn	Leu	Gly	Glu	Gly	Gln
			660					665					670		
Lys	Val	Thr	Leu	Thr	Tyr	Asp	Val	Lys	Leu	Asp	Asp	Ser	Phe	Ile	Ser
			675				680					685			
Asn	Lys	Phe	Tyr	Asp	Thr	Asn	Gly	Arg	Thr	Thr	Leu	Asn	Pro	Lys	Ser
						695					700				
Glu	Asp	Pro	Asn	Thr	Leu	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp
705					710					715					720
Val	Arg	Glu	Tyr	Pro	Thr	Ile	Thr	Ile	Lys	Asn	Glu	Lys	Lys	Leu	Gly

					725					730					735			
Glu	Ile	Glu	Phe	Ile	Lys	Val	Asp	Lys	Asp	Asn	Asn	Lys	Leu	Leu	Leu			
			740						745				750					
Lys	Gly	Ala	Thr	Phe	Glu	Leu	Gln	Glu	Phe	Asn	Glu	Asp	Tyr	Lys	Leu			
		755					760					765						
Tyr	Leu	Pro	Ile	Lys	Asn	Asn	Asn	Ser	Lys	Val	Val	Thr	Gly	Glu	Asn			
	770				775						780							
Gly	Lys	Ile	Ser	Tyr	Lys	Asp	Leu	Lys	Asp	Gly	Lys	Tyr	Gln	Leu	Ile			
785					790					795					800			
Glu	Ala	Val	Ser	Pro	Glu	Asp	Tyr	Gln	Lys	Ile	Thr	Asn	Lys	Pro	Ile			
			805						810						815			
Leu	Thr	Phe	Glu	Val	Val	Lys	Gly	Ser	Ile	Lys	Asn	Ile	Ile	Ala	Val			
		820						825					830					
Asn	Lys	Gln	Ile	Ser	Glu	Tyr	His	Glu	Glu	Gly	Asp	Lys	His	Leu	Ile			
	835					840					845							
Thr	Asn	Thr	His	Ile	Pro	Pro	Lys	Gly	Ile	Ile	Pro	Met	Thr	Gly	Gly			
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 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45
 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60
 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160

Val	Lys	Gly	Ser	Val	Pro	Asn	Gly	Lys	Ser	Glu	Ala	Lys	Ala	Val	Asn	
				165					170						175	
Pro	Tyr	Ser	Ser	Glu	Gly	Glu	His	Ile	Arg	Glu	Ile	Pro	Glu	Gly	Thr	
				180					185						190	
Leu	Ser	Lys	Arg	Ile	Ser	Glu	Val	Gly	Asp	Leu	Ala	His	Asn	Lys	Tyr	
		195						200					205			
Lys	Ile	Glu	Leu	Thr	Val	Ser	Gly	Lys	Thr	Ile	Val	Lys	Pro	Val	Asp	
	210					215					220					
Lys	Gln	Lys	Pro	Leu	Asp	Val	Val	Phe	Val	Leu	Asp	Asn	Ser	Asn	Ser	
225					230					235						240
Met	Asn	Asn	Asp	Gly	Pro	Asn	Phe	Gln	Arg	His	Asn	Lys	Ala	Lys	Lys	
				245					250						255	
Ala	Ala	Glu	Ala	Leu	Gly	Thr	Ala	Val	Lys	Asp	Ile	Leu	Gly	Ala	Asn	
			260					265						270		
Ser	Asp	Asn	Arg	Val	Ala	Leu	Val	Thr	Tyr	Gly	Ser	Asp	Ile	Phe	Asp	
		275					280					285				
Gly	Arg	Ser	Val	Asp	Val	Val	Lys	Gly	Phe	Lys	Glu	Asp	Asp	Lys	Tyr	
	290					295					300					
Tyr	Gly	Leu	Gln	Thr	Lys	Phe	Thr	Ile	Gln	Thr	Glu	Asn	Tyr	Ser	His	
305					310					315					320	
Lys	Gln	Leu	Thr	Asn	Asn	Ala	Glu	Glu	Ile	Ile	Lys	Arg	Ile	Pro	Thr	
				325					330						335	
Glu	Ala	Pro	Lys	Ala	Lys	Trp	Gly	Ser	Thr	Thr	Asn	Gly	Leu	Thr	Pro	
			340				345						350			
Glu	Gln	Gln	Lys	Glu	Tyr	Tyr	Leu	Ser	Lys	Val	Gly	Glu	Thr	Phe	Thr	
	355						360					365				
Met	Lys	Ala	Phe	Met	Glu	Ala	Asp	Asp	Ile	Leu	Ser	Gln	Val	Asn	Arg	
	370					375					380					
Asn	Ser	Gln	Lys	Ile	Ile	Val	His	Val	Thr	Asp	Gly	Val	Pro	Thr	Arg	
385					390					395					400	
Ser	Tyr	Ala	Ile	Asn	Asn	Phe	Lys	Leu	Gly	Ala	Ser	Tyr	Glu	Ser	Gln	
				405					410						415	
Phe	Glu	Gln	Met	Lys	Lys	Asn	Gly	Tyr	Leu	Asn	Lys	Ser	Asn	Phe	Leu	
			420				425						430			
Leu	Thr	Asp	Lys	Pro	Glu	Asp	Ile	Lys	Gly	Asn	Gly	Glu	Ser	Tyr	Phe	
	435					440						445				
Leu	Phe	Pro	Leu	Asp	Ser	Tyr	Gln	Thr	Gln	Ile	Ile	Ser	Gly	Asn	Leu	
	450					455					460					
Gln	Lys	Leu	His	Tyr	Leu	Asp	Leu	Asn	Leu	Asn	Tyr	Pro	Lys	Gly	Thr	
465					470					475					480	
Ile	Tyr	Arg	Asn	Gly	Pro	Val	Lys	Glu	His	Gly	Thr	Pro	Thr	Lys	Leu	
			485						490						495	
Tyr	Ile	Asn	Ser	Leu	Lys	Gln	Lys	Asn	Tyr	Asp	Ile	Phe	Asn	Phe	Gly	
		500						505					510			
Ile	Asp	Ile	Ser	Gly	Phe	Arg	Gln	Val	Tyr	Asn	Glu	Glu	Tyr	Lys	Lys	
	515						520					525				
Asn	Gln	Asp	Gly	Thr	Phe	Gln	Lys	Leu	Lys	Glu	Glu	Ala	Phe	Lys	Leu	
	530					535					540					
Ser	Asp	Gly	Glu	Ile	Thr	Glu	Leu	Met	Arg	Ser	Phe	Ser	Ser	Lys	Pro	
545					550					555					560	
Glu	Tyr	Tyr	Thr	Pro	Ile	Val	Thr	Ser	Ala	Asp	Thr	Ser	Asn	Asn	Glu	
				565					570						575	
Ile	Leu	Ser	Lys	Ile	Gln	Gln	Gln	Phe	Glu	Thr	Ile	Leu	Thr	Lys	Glu	
			580					585					590			
Asn	Ser	Ile	Val	Asn	Gly	Thr	Ile	Glu	Asp	Pro	Met	Gly	Asp	Lys	Ile	

		595					600					605							
Asn	Leu	Gln	Leu	Gly	Asn	Gly	Gln	Thr	Leu	Gln	Pro	Ser	Asp	Tyr	Thr				
	610					615					620								
Leu	Gln	Gly	Asn	Asp	Gly	Ser	Val	Met	Lys	Asp	Gly	Ile	Ala	Thr	Gly				
625					630					635					640				
Gly	Pro	Asn	Asn	Asp	Gly	Gly	Ile	Leu	Lys	Gly	Val	Lys	Leu	Glu	Tyr				
				645					650					655					
Ile	Gly	Asn	Lys	Leu	Tyr	Val	Arg	Gly	Leu	Asn	Leu	Gly	Glu	Gly	Gln				
			660					665					670						
Lys	Val	Thr	Leu	Thr	Tyr	Asp	Val	Lys	Leu	Asp	Asp	Ser	Phe	Ile	Ser				
		675					680					685							
Asn	Lys	Phe	Tyr	Asp	Thr	Asn	Gly	Arg	Thr	Thr	Leu	Asn	Pro	Lys	Ser				
	690					695					700								
Glu	Asp	Pro	Asn	Thr	Leu	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp				
705					710					715					720				
Val	Arg	Glu	Tyr	Pro	Thr	Ile	Thr	Ile	Lys	Asn	Glu	Lys	Lys	Leu	Gly				
				725					730					735					
Glu	Ile	Glu	Phe	Ile	Lys	Val	Asp	Lys	Asp	Asn	Asn	Lys	Leu	Leu	Leu				
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Lys	Gly	Ala	Thr	Phe	Glu	Leu	Gln	Glu	Phe	Asn	Glu	Asp	Tyr	Lys	Leu				
		755					760					765							
Tyr	Leu	Pro	Ile	Lys	Asn	Asn	Asn	Ser	Lys	Val	Val	Thr	Gly	Glu	Asn				
	770					775					780								
Gly	Lys	Ile	Ser	Tyr	Lys	Asp	Leu	Lys	Asp	Gly	Lys	Tyr	Gln	Leu	Ile				
785					790					795					800				
Glu	Ala	Val	Ser	Pro	Glu	Asp	Tyr	Gln	Lys	Ile	Thr	Asn	Lys	Pro	Ile				
				805					810					815					
Leu	Thr	Phe	Glu	Val	Val	Lys	Gly	Ser	Ile	Lys	Asn	Ile	Ile	Ala	Val				
			820					825					830						
Asn	Lys	Gln	Ile	Ser	Glu	Tyr	His	Glu	Glu	Gly	Asp	Lys	His	Leu	Ile				
		835					840					845							
Thr	Asn	Thr	His	Ile	Pro	Pro	Lys	Gly	Ile										
	850					855													